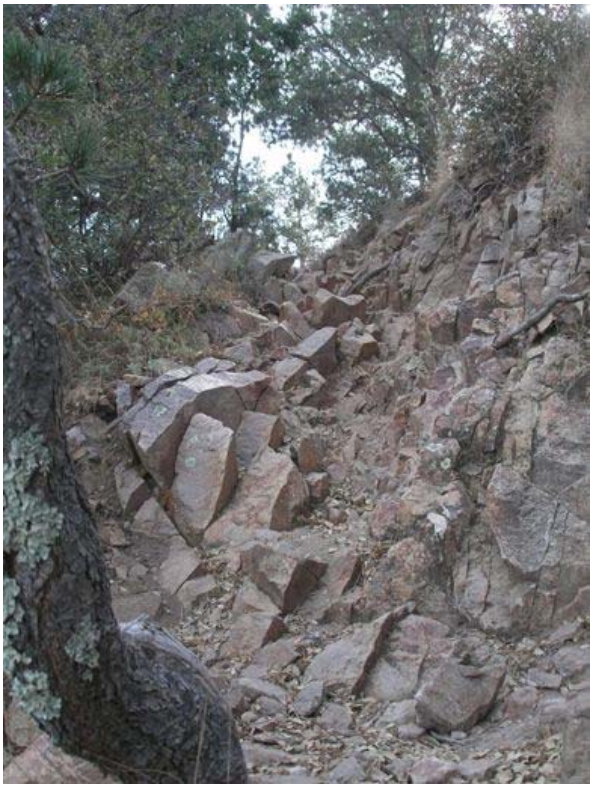
National Park Service
U.S. Department of the Interior
Big Bend National Park
Big Bend, Texas

Emory Peak Trail Realignment
Environmental Assessment

March 2007



Emory Peak Trail Realignment

Environmental Assessment

Summary

The National Park Service (NPS) at Big Bend National Park is proposing a major trail realignment of the existing Emory Peak Trail in the high Chisos Mountains. The project would construct 1.19 miles (1.92 kilometers) of new trail to bypass a 0.53 mile (0.85 kilometer) segment of the existing trail, which is poorly designed and heavily eroded. The realignment would start at the Pinnacles Pass, which is approximately 3.5 miles (5.6 kilometers) south of the Chisos Basin developed area.

The proposed realignment of the Emory Peak trail is needed to address visitor safety risks, resource damage, and an unsustainable trail design. From its junction with the Pinnacles Peak Trail, approximately 0.53 mile (0.85 kilometer) of the existing 0.90 mile (1.45 kilometer) long Emory Peak Trail is poorly designed, climbing straight up drainages and ridge lines. The trail has become heavily damaged by ongoing erosion, leading to resource damage and unsafe hiking conditions.

This Environmental Assessment (EA) evaluates two alternatives – A “No Action Alternative” and the “Proposed Action” to realign the Emory Peak Trail, which is the NPS “Preferred Alternative.” The No Action Alternative describes the current management and condition of the existing Emory Peak Trail and the environmental impacts that may occur if there were no management-initiated changes to the trail. The Proposed Action describes construction of a new trail alignment and recontouring and revegetating the existing trail footprint. This document analyzes the potential environmental effects of this trail realignment. A third alternative, to permanently close the Emory Peak Trail, was considered but rejected, because it did not meet management objectives.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that: 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to Big Bend National Park’s resources and values, and 3) identifies mitigation measures to lessen the degree or extent of adverse impacts. Resource topics analyzed in this document include soils, water resources, special status species, visitor experience and safety, and wilderness values. These topics were chosen by the interdisciplinary team, because one or both of the alternatives has the potential to have greater than minor impacts on these resources. Several other resource topics were considered but dismissed from further analysis, because neither alternative has the potential to have measurable impacts to these resources. The Proposed Action is not anticipated to have any major impacts on park resources or values. Public scoping was conducted to facilitate the development of this document, and comments were received from three government agencies and two individuals. Comments are addressed in the appropriate sections of the following environmental analysis.

Public Comment

If you wish to comment on this EA, you may post comments online at http://parkplanning.nps.gov/ or mail comments to: Superintendent; Big Bend National Park; P.O. Box 129; Big Bend National Park, Texas 79834.

This environmental assessment will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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ABBREVIATIONS AND ACRONYMS

BIBE	Big Bend National Park
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DO	NPS Director's Order
EA	Environmental Assessment
ESA	Endangered Species Act
GMP	General Management Plan
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
TCEQ	Texas Commission on Environmental Quality
UNESCO	United Nations Educational, Scientific and Cultural Organization
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

NOTES ON NEPA TERMS AND ANALYSES

The words "effect" and "impact" are synonymous in the Council on Environmental Quality (CEQ) regulations (40 CFR 1508.8(b)), which implement the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 *et seq*). In accordance with the CEQ regulations and NPS Director's Order #12, *Conservation Planning, Environmental Impact Analysis, and Decision-making* (DO-12), NEPA documents must consider "beneficial" effects and impacts as well as "adverse" effects and impacts (see 40 CFR 1508.8(b) and 40 CFR 1508.27(b)(1)). Therefore, use of the words effect and impact under NEPA can refer to both adverse and beneficial environmental changes. Conversely, the term "effect" has different meaning in the context of other environmental laws, such as the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA). Specific language relevant to the implementing regulations for these laws will be called out with quotation marks when applicable.

EAs are public documents written for use by a general audience, agency officials, and technical experts. As stated in the CEQ regulations and the NPS DO-12, EAs are intended to provide a concise and clear overview of environmental analysis relevant to the Proposed Action. Therefore, discussions of significant issues generally summarize larger bodies of data used in the environmental analysis. The *References* section of this document provides a list of public domain data sources for those who wish to conduct a more detailed study of topics discussed here.

PURPOSE AND NEED

Purpose

Big Bend National Park (Park) was established on June 20, 1935, by an act of Congress "for recreational park purposes…[and]…for the benefit and enjoyment of the people." The Park encompasses more than 801,000 acres in south Brewster County in southwest Texas (Figure 1). The "big bend" of the Rio Grande River forms the park's southern international boundary with Mexico. The Park has national significance as the largest protected area of Chihuahuan Desert topography and ecology in the United States (NPS 2004) and has international significance as a designated biosphere reserve (UNESCO 1976). The Park's river, desert, and mountain environments support an extraordinary richness of biological diversity and provide unparalleled recreational opportunities. The Park's geology offers opportunities to study igneous and sedimentary processes, including Cretaceous and Tertiary processes of paleontological interest. Archeological and historic resources provide examples of cultural interaction in the Big Bend Region and the varied ways humans adapted to the desert and river environments (NPS 2004).

The Park proposes to construct a trail realignment for the purpose of addressing problems with a heavily eroded and damaged 0.53 mile (0.85 kilometer) segment of the existing Emory Peak Trail. Following construction of a new trail alignment, the damaged segment of the existing trail alignment would be closed to visitors and rehabilitated to facilitate the reestablishment of natural drainage and vegetation cover and stabilize soils. Therefore the "Proposed Action" is comprised of two main components: 1) Construction of a new trail alignment that bypasses of the damaged segment of the existing trail; and 2) Rehabilitation of the damaged segment of the trail that has been bypassed.

The Proposed Action would meet the primary objectives of the Park's enabling legislation – to provide for recreational park purposes and public enjoyment – because it would provide a more enjoyable and safer visitor experience. The Proposed Action would also address ongoing damage to Park resources caused by erosion problems on the existing trail. The primary goals and objectives of the Proposed Action are as follows:

1. Improve safety for visitors and staff who use the Emory Peak Trail.

2. Provide a better visitor experience on the Emory Peak Trail.

3. Minimize impacts to park resources.

4. Provide a sustainable design for the trail that would make its long-term maintenance practical.

This EA examines potential environmental impacts associated with the proposal to construct a new trail alignment that bypasses a poorly designed segment of the Emory Peak Trail. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500 *et seq*), and NPS Director's Order #12, *Conservation Planning, Environmental Impact Analysis, and Decision-making* (DO-12).

Need

Big Bend National Park typically receives between 300,000 and 400,000 visitors every year. Approximately 80% of visitors use the Park's trails – the majority of the trails being in the High Chisos Mountains (pers. comm. Park's Interdisciplinary Team, January 2007). Emory Peak Trail – part of the High Chisos Mountains Trail System – is one of the most popular and heavily used destination hikes in Big Bend National Park. Emory Peak Trail is used daily throughout the entire year, including the warmer times of the year when the high elevation Chisos Mountains offer a cooler hiking experience than other areas of the Park. From the Chisos Basin developed area, hikers travel 3.5 miles (5.6 kilometers) along the Pinnacles Trail then another 0.90 miles (1.45 kilometers) up the Emory Peak Trail to the summit. At

7,832 feet (2,387 meters) above mean sea level, the Emory Peak summit is the highest point in the Park and the ninth highest point in Texas. The Emory Peak summit offers unrivaled 360-degree views of the surrounding landscape. On a clear day, for instance, one can see the Mountains of Mexico across the border to the south and to the north one can see the McDonald Observatory over 100 miles away in the Davis Mountains. At times the Emory Peak Trail accommodates single groups comprised of over 50 people, each challenging the 8.8 mile (14.16 kilometer) arduous roundtrip hike from the Basin to the summit and back. Backpackers with the appropriate permits can stay the night in the Chisos Mountains at one of the Park's backcountry camping sites, including one small campsite on Emory Peak that accommodates up to six people. Many visitors are drawn to stay the night in the Chisos by the unparalleled view of what – according to researcher Dan Duriscoe of the NPS Night Sky Team – is probably the most pristine night sky of any national park in the contiguous 48 states (pers. comm. Raymond Skiles, NPS Wildlife Biologist and Wilderness Coordinator, January 2007).

The Emory Peak trail is the only access to the Emory Peak summit. In addition to offering a unique visitor experience, the summit is also the location for a radio repeater system, which provides a means of communication for NPS including Park staff and medics, as well as other agencies such as the U.S. Customs and Border Protection, the International Boundary Water Commission, the Texas Department of Public Safety, and the Brewster County Sheriff. Because much of Brewster county is so remote, with little infrastructure, radios are often the only way for local agencies and medical personnel to communicate during emergency response and incident management operations. The radio repeater system is powered by batteries attached to a solar array, which must be accessed periodically for maintenance. Therefore maintaining safe access to the Emory Peak summit is important, not only for visitors, but for Park staff and other agencies as well.

The existing Emory Peak Trail in its current condition is no longer practical to maintain, it is very unsafe for hikers, and it is adversely impacting natural and cultural resources. The 0.53 mile (0.85 kilometer) of the existing 0.90 mile (1.45 kilometers) trail is extremely eroded and very poorly designed, climbing straight up drainages and ridge lines. The existing running slope of the trail traverses grades of up to 40% (22 degree slope), making it prone to erosion and generally difficult for hikers to navigate. Some areas of the trail have eroded to as much as 4.50 feet (1.37 meters) below natural grade. During rain events, massive water flows travel down the trail tread causing severe drainage problems and maintenance challenges. Because the trail is poorly designed and interferes with natural drainage patterns on Emory Peak, it has degraded to a point that maintenance of the trail has become impractical. Because it is anticipated that any maintenance work on the existing trail would be washed out during storm events, as it has in the past, the trail is no longer being maintained by the Trails Maintenance Crew.

Erosion of the existing trail is also causing resource damage to soils, vegetation, cultural resources, and a unique riparian habitat. For decades, erosion from the existing trail has likely caused sediment export from Emory Peak to a unique and sensitive riparian habitat in Boot Canyon, which lies below the trail (pers. comm. Jeffrey Bennett, NPS Hydrologist, January 2007). Also as a result of erosion and poor trail conditions, there have been multiple trail-related injuries attributed to tread degradation, which causes poor footing. On average, visitors report 2-3 injuries a year – typically sprained and broken ankles. The existing Emory Peak Trail has degraded to a point that repairing it and maintaining it are no longer feasible, and its redesign represents the Trails Maintenance Program's highest priority in backlogged maintenance (pers. comm. Don Sharlow, NPS Trails Supervisor, January 2007).

Although trails are inherently dynamic features that will ultimately degrade and require maintenance, well designed trails are easier to maintain and require fewer maintenance episodes. Well designed trails are also safer and more enjoyable for visitors, and they reduce the potential for impacts to natural and cultural resources that may result from foot traffic and erosion. For best hiking conditions and to reduce maintenance needs, trails should ideally follow a linear gradient of less than 10% (5.8 degree slope) (Griswold 1982, USFS 1984). The proposed redesign would reduce the linear gradient of the trail to below 10% (5.8 degree slope) and meet sustainable trail design standards. An improved trail design and layout is necessary to reduce ongoing resource damage and unmanageable maintenance problems. Significant natural resource damage continues to occur at this time and needs to be addressed as soon

as possible. Realignment of the Emory Peak Trail is needed to address visitor experience needs, safety risks, resource damage problems, and problems associated with an unsustainable trail design.

Scoping

Scoping is a process intended to identify the resources that may be affected by a proposed action, and to explore possible alternative ways of achieving the objectives of a proposed action while minimizing adverse impacts. Big Bend National Park conducted both internal scoping with appropriate NPS staff and external scoping with the public and other agencies.

Internal scoping was conducted with an interdisciplinary team of environmental professionals from Big Bend National Park. Project information needed to begin internal scoping was entered into the NPS "Planning, Environment and Public Scoping" (PEPC) online system in February 2006. Interdisciplinary team members were provided details of the Proposed Action in several informal meetings, site visits with the Trails Maintenance Supervisor, and through the completion of an "Environmental Screening Form," recorded in PEPC in May 2006. Additionally, interdisciplinary team members met on January 9, 2007 to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and to develop mitigation measures. Prior to the January 2007 interdisciplinary team meeting, data needed to identify potential impacts to resources had been obtained during site visits to the proposed project area by interdisciplinary team members and other technical experts.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposed trail realignment, and to generate input relevant to the preparation of this EA. The scoping letter, dated August 17, 2006, was mailed to 61 interested parties including local, state, and federal agencies; special interest groups; academic institutions; businesses; and individuals. In addition, the scoping letter was mailed to the Park's seven affiliated Native American tribes. Scoping information was also posted on the Park's website.

During the 30-day scoping period, five responses were received. One individual suggested that the NPS should consider permanent closure of the Emory Peak Trail as an alternative. This alternative was examined by the interdisciplinary team and ultimately dismissed as not meeting the objectives of the Proposed Action, because visitor experience would be diminished, access to the radio repeater system would be cut off, and closure would require a major and costly rehabilitation effort to mitigate ongoing natural and cultural resource degradation associated with the existing trail. The remaining responses included some in favor of the project and some requesting more information.

Relationship to Other Plans and Policies

Plans and policies relevant to the Proposed Action include the Park's enabling legislation, the Park's General Management Plan (GMP)(NPS 2004), the *Big Bend National Park Backcountry Management Plan* (NPS 1995), and NPS *Management Policies 2006* (NPS 2006). The Proposed Action would meet the goals and objectives of these plans and policies in the following ways:

- The Park's enabling legislation states that the Park was set aside "for recreational park purposes…[and]…for the benefit and enjoyment of the people." The Proposed Action would meet the objectives of the Park's enabling legislation by improving visitor enjoyment of primary Park resources.

- The central objective of the Park's GMP (NPS 2004) is to enhance visitor experience while protecting Park resources. The Park's GMP outlines measures for managing backcountry areas, which includes improving hiking trails. The Proposed Action would meet some main objectives of the GMP by enhancing visitor experience and reducing resource damage.

- The *Big Bend National Park Backcountry Management Plan* (NPS 1995) identifies Emory Peak Trail as a "major use trail." The Park's backcountry management plan states that major use trails are to be "Maintained for high use, the walking surface is kept fairly even and free of larger rocks. Water bars

are kept clean and functional to prevent erosion." The Proposed Action meets the objectives outlined in this plan.

- NPS *Management Policies* 2006 (NPS 2006) state that trails "will be planned and developed as integral parts of each park's transportation system and incorporate principles of universal design. Trails and walks will serve as management tools to help control the distribution and intensity of use. All trails and walks will be carefully situated, designed, and managed to: reduce conflicts with automobiles and incompatible uses; allow for a satisfying park experience; allow accessibility by the greatest number of people; and protect park resources." The proposed trail realignment has been designed to meet these objectives.

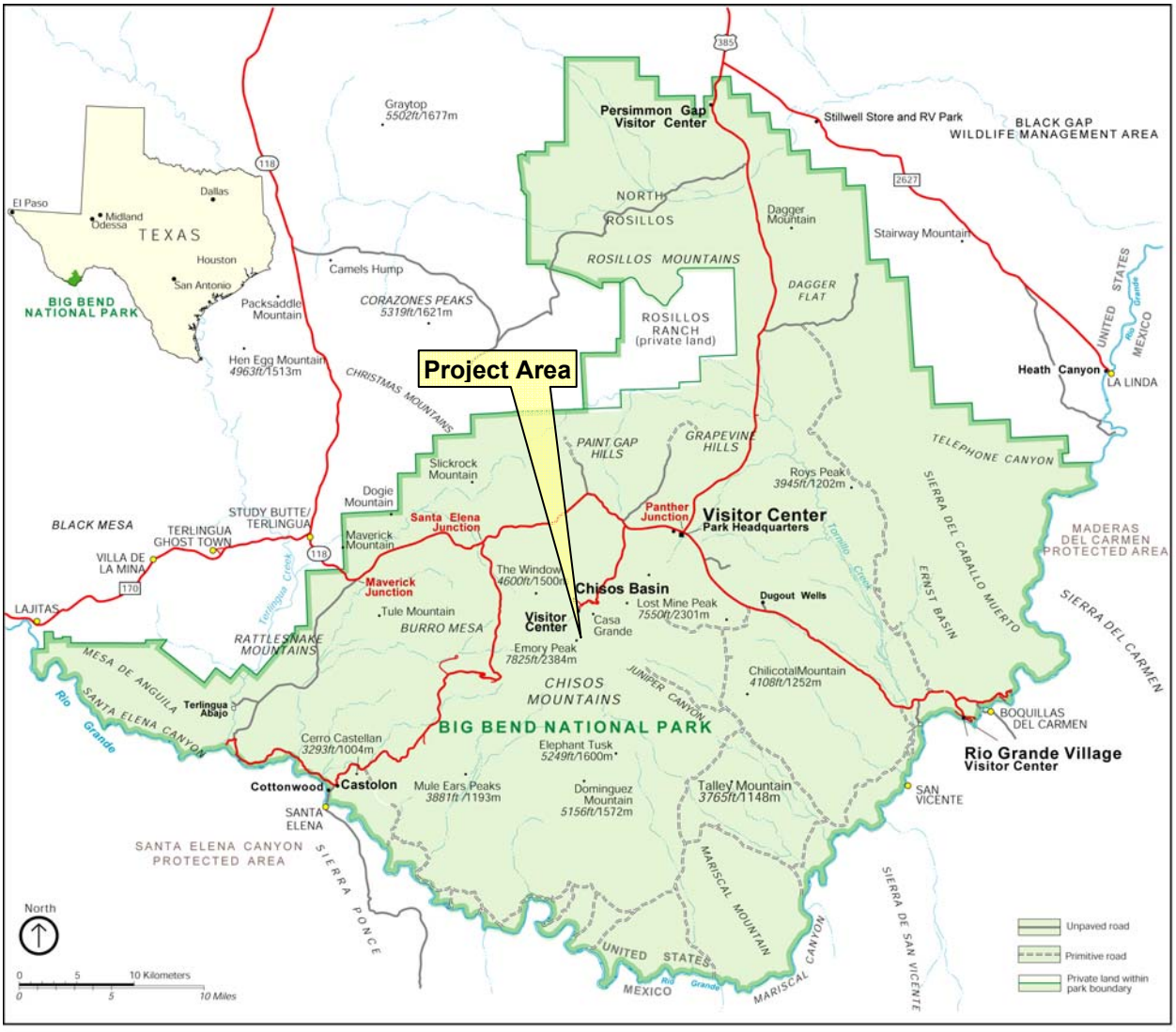

Figure 1 – Project Location

Impact Topics Retained for Further Analysis

Impact topics analyzed for the No Action Alternative and the Proposed Action have been identified on the basis of federal laws and regulations, NPS Director's Orders, NPS *Management Policies 2006* (NPS 2006), and NPS knowledge of resources at Big Bend National Park. A brief overview of impact topics retained for further analysis in this EA are listed below along with the reasons why the impact topic is further analyzed. Detailed analysis of each of these topics, including the regulatory context and the existing baseline conditions (affected environment) for each of these topics is provided in the *Environmental Consequences* section of this document.

Soils

The Proposed Action is expected to have moderate beneficial impacts on soils in the area of the existing trail, and the No Action Alternative is expected to have continued moderate adverse impacts on soils in the area of the existing trail. Therefore the topic of soils has been retained for further analysis.

Water Resources

The Proposed Action is expected to have moderate beneficial impacts on water resources in Boot Canyon, and the No Action Alternative is expected to have continued minor to moderate adverse impacts on water resources in Boot Canyon. Therefore the topic of water resources has been retained for further analysis.

Special Status Species

Mitigation measures have been developed to ensure that the Proposed Action would not have measurable impacts on special status species. Without these mitigation measures, the Proposed Action would have the potential for minor to moderate adverse impacts on special status species. Therefore the topic of special status species has been retained for further analysis.

Visitor Experience and Safety

The Proposed Action is expected to have moderate beneficial impacts on visitor experience and safety on Emory Peak, and the No Action Alternative is expected to have continued minor to moderate adverse impacts on visitor experience and safety on Emory Peak. Therefore the topic of visitor experience and safety has been retained for further analysis.

Wilderness Values

The project area has been recommended for wilderness designation, and according to NPS policy, the Park manages the area as wilderness. As per management policies 2006 (NPS 2006), regardless of the category of wilderness, NPS "will take no action that would diminish the wilderness eligibility of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed. Until that time, management decisions will be made in expectation of eventual wilderness designation." Although it is not anticipated that the Proposed Action would require tools other than hand tools, unforeseen trail design obstacles may require the use of blasting and/or motorized equipment, in which case the Proposed Action would have the potential for minor to moderate adverse impacts on wilderness values. Therefore the topic of wilderness values has been retained for further analysis.

Impact Topics Dismissed From Further Analysis

The following presents an overview of impact topics that were considered but ultimately dismissed from detailed analysis. Impact topics were dismissed from further analysis if it was determined that the project did not have the potential to cause significant measurable change to these resources and values. The

regulatory context and baseline conditions relevant to each impact topic were briefly analyzed in the process of determining if a topic should be retained or dismissed from further analysis. An outline of background information used in considering each topic is provided below along with the reasons for dismissing each topic from further analysis.

Topography and Geology

NPS *Management Policies 2006* (NPS 2006) state that the NPS will preserve and protect geologic features and geologic processes as integral components of park natural systems. The project area is located on Emory Peak in the high Chisos Mountains within the general geographic area known as the Basin and Range physiographic province. At 7,832 feet (2,387 meters) above mean sea level, Emory Peak summit is the highest point in Brewster County and the ninth highest point in the state of Texas.

The Chisos Mountains are a mix of sedimentary and igneous geologic formations. Emory Peak is primarily comprised of the igneous South Rim Formation – part of the Pine Canyon Caldera. Emory Peak represents a weather resistant lava cap that formed as a Cenozoic igneous intrusion that elevated layers of several earlier period geologic layers that eventually eroded to expose the Burro Mesa Rhyolite, which caps Emory Peak today. Other members of the South Rim Formation that may form parts of the surface geology in the project area include the Boot Rock Member and possibly part of the Lost Mine Member (Price *et al* 1986).

Minor ground disturbance would be required to achieve the gradual grade climb necessary to provide a sustainable design for the new trail alignment. Soils and rock removed during construction of the new trail alignment would be used to rehabilitate eroded segments of old trail that would no longer be used. None of the rock used in the rehabilitation of the existing trail alignment would be harvested from pristine or large bedrock outcrops. Rehabilitating the eroded portions of the existing trail and restoring the natural grade in these areas is expected to have a beneficial effect on local geology by reducing erosion. Because the Proposed Action would have a net effect on topography and geology that would be negligible, this topic has been dismissed from further analysis.

Wetlands

Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. NPS *Management Policies 2006* (NPS 2006) and Director's Order 77-1 *Wetlands Protection*, mandate that the NPS will strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

For regulatory purposes, the term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. The project area has been examined by the Park's hydrologist, who has determined that the project area is not located within or adjacent to wetlands (pers. comm. Jeffrey Bennett, NPS Hydrologist, January 2007). Because there are no wetlands within or adjacent to the project area, this topic has been dismissed from further analysis.

Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. As per NPS *Management Policies 2006* (NPS 2006) and Director's Order 77-2 *Floodplain Management*, NPS is mandated to strive to preserve floodplain values and minimize hazardous floodplain conditions. The project area has been examined by the Park's hydrologist, who has determined that the project area is not located within a 100-year floodplain (pers. comm. Jeffrey Bennett, NPS Hydrologist, January 2007). Therefore, the topic of floodplains has been dismissed from further study. Because the project area is not located within a 100-year floodplain, this topic has been dismissed from further analysis.

Air Quality

The Clean Air Act (CAA) of 1963 (42 U.S.C. 7401 *et seq.*) was established to promote public health and welfare by protecting and enhancing the nation's air quality. Section 118 of the CAA requires the park to meet all federal, state, and local air pollution standards. Because the Park is a national park encompassing more than 6,000 acres, it is classified as a Class I airshed under the CAA, as amended. This stringent air quality classification protects Class I airsheds from air quality degradation. The CAA outlines the responsibility of federal land managers in protecting air quality and related values and resources including visibility, plants, animals, soils, water quality, cultural resources, and public health from adverse air pollution impacts. Under the 1990 CAA Amendments, the U.S. EPA sets limits for how much of certain pollutants can be in the air anywhere in the United States. These limits are referred to as the National Ambient Air Quality Standards (NAAQS). Six criterion air pollutants are monitored for compliance with NAAQS: Carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), fine particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). New developments or operations that have the potential to be "major point sources" of air pollutants must apply for operating permits under the federal Title V operating permit program ("Part 71 Program"). Areas where pollutant levels are above the NAAQS limits, and therefore are not in compliance with the NAAQS, are termed "non-attainment areas." In non-attainment areas, local ordinances and state policies may require stricter monitoring of even minor sources of air pollution.

The only air quality monitor within Brewster County is located within the Park boundaries, approximately 9 miles northeast of the project site. Data recorded by the Park's air quality monitor for the 2006 calendar year include data for O_3 and $PM_{2.5}$. These data indicate that neither of these pollutants has exceeded the NAAQS in the overall park vicinity. The project area is not in a non-attainment area and the Proposed Action does not have the potential to be a "major point source" of air pollution under the CAA. Additionally, the project does not have the potential to affect visibility or any other air quality values defined for Class I airsheds. Because the Trails Maintenance Crew plans to accomplish the project using hand tools, it is anticipated that the Proposed Action would not result in measurable change in air quality. Neither the Proposed Action nor the No Action Alternative has the potential to have measurable impacts on air quality, and therefore this topic has been dismissed from further analysis.

Vegetation

According to the NPS *Management Policies 2006* (NPS 2006), NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants. The NPS *Management Policies 2006* (NPS 2006) also contains management guidelines for avoiding the introduction of exotic plant species, and removal, when necessary, of exotic plant species from NPS units.

The project area is located in a pinyon-juniper-oak woodland biotic community that is common throughout the Chisos Mountains. Dominant trees in the area include Mexican pinyon (*Pinus cembroides)*, three species of juniper (*Juniperus* spp.), and at least six species of oak (*Quercus* spp.). Other common trees include Texas madrone (*Arubutus xalapensis)*, bigtooth maple (*Acer grandidentatum*), Arizona Cypress (*Cupressus arizonica*), and Douglas fir (*Pseudotsuga menziesii*). Common shrubs and succulents of the upper slopes include Lindheimer silktassel (*Garrya lindheimeri*), mountain sage (*Salvia regla*), and foothill nolina (*Nolina erumpens*). Other shrubs, including Engelmann pricklypear (*Opuntia engelmannii*), Havard agave (*Agave havardiana*), true mountain mahogany (*Cercocarpus montanus*), fragrant sumac (*Rhus aromatica)*, and scarlet bouvardia (*Bouvardia ternifolia*) are more widely distributed. The most dominant species of herbs are threadleaf snakeweed (*Xanthocephalum microcephalum*) and *white sagebrush* (*Artemisia ludoviciana*). The most common grass in the general area is sideoats grama (*Bouteloua curtipendula*). However, at higher elevations pinyon ricegrass (*Piptochaetium fimbriatum*), bullgrass (*Muhlenbergia emersleyi*), finestem needle-grass (*Nassella tenuissima*), southwestern needlegrass (*Achnatherum eminens*), and single threeawn (*Aristida schiedeana*) can be locally dominant. A botanical

survey of the project area conducted NPS biologists in September 2006 showed that there are no exotic plant species in or adjacent to the project area.

Small amounts of vegetation would be displaced, disturbed, and/or compacted in the areas of construction particularly in the footprint of the new trail alignment. Approximately three small trees would be removed from these areas as well. These disturbances would result in negligible, site-specific, adverse effects on vegetation. However, reseeding and reestablishing natural drainage patterns in the area of the rehabilitated trail would likely have negligible to minor site-specific beneficial effects on vegetation. Because the net effects on vegetation of the No Action Alternative and the Proposed Action would be negligible to minor and site-specific, this topic has been dismissed from further analysis. However, potential impacts to "special status species," including special status vegetation, are addressed in the *Environmental Consequences* section of this document (see below).

Wildlife

NPS *Management Policies 2006* (NPS 2006), states that the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals. Common wildlife in the Chisos Mountains and surrounding areas include Sierra del Carmen whitetail deer (*Odocoileus virginianus carminis*), striped skunk (*Mephitis mephitis*), mountain lion (*Puma concolor*), black bear *(Ursus americanus)*, bats (*Myotis* spp.), several species of mice (*Peromyscus* spp. and *Perognathus* spp.), wood rats (*Neotoma* sp.), two kinds of cottontail rat (*Signodon* spp.), squirrels (*Spermophilus* spp.), and over 100 species of birds including broad-tailed hummingbirds (*Selasphorus platycercus*), bushtits (*Psaltriparus minimus*), Mexican jays (*Aphelocoma ultramarina*) western screech owls (*Otis kennicottii*), elf owls (*Micrathene whitneyi*), flammulated owls (*Otis flammeolus*), northern flicker (*Colaptes auratus*), acorn woodpecker (*Melanerpes formicivorus*), spotted towhee (*Pipilo maculatus*), and several species of warblers including the Colima warbler (*Vermivora crissalis*) – a species that nests nowhere else in the United States.

Although the location of the proposed trail realignment is in a backcountry area of the Park, it is an area that is subject to frequent use by visitors. The presence of humans has likely limited the number and variety of wildlife, especially sensitive wildlife, in the immediate area of the Proposed Action. During construction, noise would increase, which may disturb wildlife in the local area. Construction-related noise would be temporary and negligible to minor, and existing sound conditions would resume following construction activities. Because the net effects on wildlife of the No Action Alternative and the Proposed Action would be negligible to minor and localized, this topic has been dismissed from further analysis. However, potential impacts to "special status species," including special status wildlife, are addressed in the *Environmental Consequences* section of this document (see below).

Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA), as amended in 1992 (16 USC 470 *et seq.*); NPS Director's Order #28, *Cultural Resources Management* (DO-28); NPS-28, *Cultural Resource Management Guideline*; and NPS *Management Policies 2006* (NPS 2006) require the NPS to consider the effects of their undertakings on historic properties that are listed in or eligible for listing in the National Register of Historic Places (National Register). The National Register contains a wide range of historic property types, including historic buildings and structures, archeological sites, groups of buildings or sites forming historic districts, cultural landscapes, and individual objects. The potential to affect eligible cultural resources (historic properties) must be evaluated for the entire "area of potential effects" (APE) for a given undertaking. The APE is defined as the entire footprint of all project activities and may include the viewshed surrounding the project footprint.

When a federal undertaking has the potential to affect properties listed in or eligible for listing in the National Register, NHPA Section 106 and its implementing regulations (36 CFR 800) require federal agencies to consult with the State Historic Preservation Officer (SHPO) and affiliated tribes, as appropriate. Through a servicewide programmatic agreement with the Advisory Council on Historic

Preservation and the National Conference of State Historic Preservation Officers, the NPS has defined the process under which parks consult with the appropriate interested parties. The park notified the Texas SHPO (Texas Historical Commission) of the Proposed Action during initial scoping in August 2006. In a response dated September 6, 2006, the SHPO provided documentation indicating that a finding of "no historic properties affected" is appropriate for the project (see the Consultation and Coordination section of this document).

Historic Structures

NPS-28: Cultural Resource Management Guideline defines a historic structure as "a constructed work . . . consciously created to serve some human activity" (NPS 1998). Because there are no historic structures in the project area, this topic has been dismissed from further analysis.

Archeological Resources

Archeological resources are the tangible remains of human occupations that are no longer in use. The proposed location for the trail realignment was surveyed for cultural resources by the Park's Archeologist, and no archeological sites were identified in or adjacent to the APE for the new trail alignment. There is, however, an archeological site adjacent to the existing trail with a spur footpath trailing through the site (pers. comm. Thomas Alex, NPS Archeologist, January 2007). The archeological site would be flagged for avoidance prior to the start of construction to ensure that rehabilitation of the existing trail would not cause new impacts to the site. Ultimately, the Proposed Action would have a negligible beneficial effect on cultural resources by reducing human use in the area of a known archeological site. There are no known archeological deposits in the APE for the new trail alignment and the shallow soil depth make it unlikely that buried deposits exist in the area. However, the possibility that buried deposits may be discovered must always be considered when conducting ground disturbing work. Therefore, if previously unidentified cultural resources should be discovered during construction, work would stop in the area of discovery and the park's Section 106 Coordinator would be contacted to determine the appropriate course of action. Because a determination of "No historic properties affected" has been made for this project, this topic has been dismissed from further analysis.

Ethnographic Resources

As defined in NPS-28, *Cultural Resource Management Guideline* (1998), ethnographic resources may be any "site, structure, object, landscape or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it." Ethnographic resources may include sites that are eligible for inclusion in the National Register. National Register Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties* (TCPs), provides guidance for determining National Register eligibility for a historic property based on "traditional cultural significance," which may be defined as "those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice." Many TCPs are Native American religious sites that are protected under the American Indian Religious Freedom Act and Executive Order 13007, *Indian Sacred Sites*; as well as the NHPA. NPS-28*, Cultural Resource Management Guideline* (1998), which implements the DO-28, states that the NPS must strive to preserve and protect ethnographic resources.

Historical documents by the Spanish indicate that the Chisos Mountains and surrounding areas were occupied in the 1600s (and earlier) by the Chizo (Chisos) Indians. This group was apparently linked with cultures in northern Mexico. Linguistically, the Chisos spoke the Concho dialect of the Uto-Aztecan language. The final status and location of the Chisos Indians is unknown. Neighboring bands fled the intrusion of Apache invaders, escaping southward to security with related cultures. The same is probably true of the Chisos (NPS 2004).

Ethnographic resources of importance to modern living descendants of the people who occupied the Chisos Mountains are not known to exist in the proposed project area. In addition, the seven tribes affiliated with the park – Apache Tribe of Oklahoma, Blackfeet, Comanche Tribe of Okalahoma, Kickapoo Traditional Tribe of Texas, Kiowa Tribe of Okalahoma, Mescalero Apache Tribe, and Ysleta Del Sur Pueblo – were notified of the Proposed Action in a letter dated August 17, 2006. No tribes responded with

concerns regarding the Proposed Action. Because there are no known ethnographic resources in the project area, this topic has been dismissed from further analysis.

Cultural Landscapes

NPS-28, *Cultural Resource Management Guideline* (NPS 1998) states that a cultural landscape is "a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls and vegetation, and by use reflecting cultural values and traditions." A cultural landscape comprises all cultural and natural resources associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values within a given geographic area. Cultural landscapes are the result of the interaction between humans and the natural landscape.

The Chisos Mountains have been identified as encompassing the boundaries of the Chisos Basin cultural landscape, which includes the Chisos Basin and its viewshed to the surrounding peaks. Themes of this cultural landscape include Native American occupation, CCC development, and historic park development. Historic trails are one of the historic property types identified for this cultural landscape. The Emory Peak Trail, however, is not a contributing element of the Chisos Basin cultural landscape or any other known cultural landscapes. Because there are no known contributing elements to a cultural landscape that would be affected by the No Action Alternative or the Proposed Action, this topic has been dismissed from further analysis.

Museum Collections

According to NPS Director's Order #24, *Museum Collections* (DO-24), the NPS must consider the potential for impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material). The DO-24 provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. Because the project area is not located near any museum collection facilities, this topic has been dismissed from further analysis.

Indian Trust Resources

Indian trust resources are assets held in trust by the United States for Native Americans. The U.S. Department of the Interior's (DOI) Secretarial Order 3175, *Departmental Responsibilities for Indian Trust Resources,* requires that any anticipated impacts to Indian trust resources from a proposed project or action by DOI agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights; and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources at Big Bend National Park. Because there are no lands within the Park held in trust by the Secretary of the Interior for the benefit of Indians, this topic has been dismissed from further analysis.

Environmental Justice

The EPA defines environmental justice as the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people; including a racial, ethnic, or socioeconomic group; should bear a disproportionate share of the negative environmental consequences of industrial, municipal, or commercial operations or the execution of federal, state, local, or tribal programs and policies. Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* requires that all federal agencies, to the extent practicable and permitted by law, consider environmental justice effects by

identifying and assessing potential disproportionate adverse human health and environmental effects of programs, policies, and activities on minority and low-income populations.

The proposed project area is located in Brewster County. The U.S. Census Bureau 2000 statistics show that the population of Brewster County is 8,866, of which 34% of the in labor force live below the federal poverty level, and 62.5% of the population may be considered members of a minority ethnic group. Because the nature and location of the Proposed Action would not have the potential to have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in EPA (1998) and CEQ (1997) environmental justice guidance, this topic was dismissed from further analysis.

Socioeconomics

The NPS DO-12 requires that NPS units consider potential direct and indirect impacts to the local economy, including impacts to neighboring businesses in the general project vicinity. The Proposed Action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Because the Proposed Action does not have the potential to impact the socioeconomic environment of the area, this topic has been dismissed from further analysis.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider the effects of their actions on prime and unique farmland soils. Prime farmland is defined in the Federal Register, Vol.6, Parts 400-699, January 1, 2001, Section 657.5(a). Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also suitable for cropland, pastureland, rangeland, or forestland. It is not suited to urban or water use. Prime farmland has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops according to acceptable farming methods. Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops. The NRCS maintains data for prime and unique farmlands throughout the United States. However federal lands are not included in the NRCS inventory. Based on the Texas criteria for prime or unique farmlands (NRCS n.d.), soils in the project area are not suitable for supporting prime or unique farmland, and therefore this topic has been dismissed from further analysis.

Soundscape Management

In accordance with NPS *Management Policies 2006* (NPS 2006) and Director's Order #47, *Sound Preservation and Noise Management*, an important component of the NPS's mission is the preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The proposed location for the new trail realignment and all associated construction activities would occur in an area of the Park that is heavily used by visitors. Sound generated by the short-term construction of the trail realignment may include sounds from breaking rock with hand tools, excavating with digging tools, and other similar sounds. Because the area is already subject to human-caused sound and the trail realignment's short-term construction sounds and long-term use sounds are not expected to significantly increase the noise levels in the local area, this topic has been dismissed from further analysis.

Lightscape Management

In accordance with NPS Management Policies 2006, the NPS strives to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human caused light. The Park strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. There are no lights on Emory Peak. According to researcher Dan Duriscoe of the NPS Night Sky Team, Big Bend National Park is located in what is probably the most pristine night sky of any national park in the contiguous 48 states. Although numerous point sources of light from nearby areas – including the Study Butte, Terlingua, Lajitas, and Chisos Basin developments – are visible from the project area, night sky studies conducted from Emory Peak with fine-grained analytic techniques and recording equipment show that there is no visible light pollution on Emory Peak summit from the zero horizon (a measurement indicating instrument height at the summit) and upward. Below the horizontal plane from Emory Peak, light domes from distant cities, including Chihuahua City, El Paso/Juarez, Midland/Odessa, Fort Stockton, and Del Rio/Ciudad Acuna are visible but not significantly intrusive. The protected night sky offers unique opportunities for its enjoyment and for studies of both amateur and professional astronomers. Brewster County (2001) has passed an outdoor lighting ordinance to protect the night sky for both the Park and for the McDonald observatory, located approximately 100 miles north of Emory Peak in the Davis Mountains. Because there are no lights on Emory Peak and there would be no lights added as part of the Proposed Action, this topic has been dismissed from further analysis.

Park Operations

Parks must consider the potential effects of proposed actions on overall park operations. Trails maintenance and management are the main park operations relevant to the project area. The Emory Peak Trail itself is not currently being maintained on a regular basis, because the degree of degradation of the trail makes its maintenance impractical. Because the new trail alignment would be constructed with a sustainable design, maintenance episodes would increase in an area that is currently not subject to trails maintenance, but the maintenance needs of the completed new trail alignment are expected to be negligible (pers. comm. Don Sharlow, NPS Trails Supervisor, January 2007). The Proposed Action would result in no measurable effect on overall Park operations. Because the Proposed Action is not expected result in measurable change to the Trails Maintenance Program's operations or overall Park operations, this topic has been dismissed from further analysis.

ALTERNATIVES CONSIDERED

During January of 2007, an interdisciplinary team of NPS employees met for the purpose of developing project alternatives. This meeting resulted in the definition of project objectives, and a list of alternatives that could potentially meet these objectives. Two action alternatives and the No Action Alternative were initially considered for this project. Of these, one of the action alternatives – the alternative to close the Emory Peak Trail – was dismissed from further consideration, because it was not prudent or feasible. One action alternative and the No-Action Alternative are carried forward for further evaluation in this EA. A summary table comparing alternative components is presented at the end of this chapter.

Alternatives Analyzed

NEPA's implementing regulations (40 CFR 1502.14) require analysis of at least two alternatives, including the alternative of taking no action – the "No Action Alternative" – and the alternative that is the Proposed Action, which is usually the "Preferred Alternative." NPS DO-12 recommends that it is appropriate to interpret the No Action Alternative as a "continuation of existing conditions and activities." That is, the No Action Alternative should be taken to mean "no change" in current conditions, and it is meant to serve as a baseline against which other alternatives may be measured. NPS DO-12 recommends that the Proposed Action may be considered the Preferred Alternative when sufficient analysis has been conducted to evaluate the relative merits of each reasonable alternative. In addition to the No Action Alternative and the Preferred Alternative, NPS DO-12 directs NPS managers to identify the "Environmentally Preferred Alternative" from among the alternatives evaluated.

The No Action Alternative – No Change in Current Conditions

Under this alternative, the trail realignment would not be constructed, and the existing trail alignment would continue to be used as it is now. Figures 2 and 3 provide photographs of existing trail conditions. Frequent maintenance episodes would be required to address ongoing erosion problems, which would be costly and time consuming. Due to current budget and time constraints and the condition of the existing trail, it is currently impractical to maintain the trail. Because the existing trail does not have a sustainable design, and previous repairs have been washed out within a few months of completion of those repairs, it is expected that any future repairs would also be washed out in a short time. Severe weather conditions would cause the trail to become more heavily eroded, likely resulting in segments of the trail being unusable. Should the No Action Alternative be selected, the NPS would make all attempts to respond to future needs and conditions of the trail without major actions or changes in present management direction. However, because funding and environmental limitations would likely prevent the appropriate maintenance of the trail, the Park may have to consider emergency trail closure when trail conditions pose severe risks to human safety and/or Park resources.

The Proposed Action – Realign a Segment of the Trail

The Proposed Action would construct a 1.19 mile (1.92 kilometer) realignment of the Emory Peak Trail (Figure 4). The project area is located approximately 3.0 miles (4.8 kilometers) south of the Chisos Basin developed area, beginning at the Pinnacles Pass area where the Emory Peak Trail meets the Pinnacles Trail. The existing trail measures up to 6 feet wide and climbs grades of up to 40% (22 degree slope) through drainages and ridgelines, which has led to extensive erosion. The new trail would be 1.5-2 feet wide and would follow natural terrain contours to create a trail with an average 7% grade (4 degree slope). Trail design techniques would include outsloping and partial bench cutting. The work would be accomplished by Park trail crews and volunteer groups.

Tools to be used in the construction of the new trail alignment would include hand tools such as shovels, picks, hand saws, rock hammers, and sledge hammers. Highline rigging gear would be used to prevent ground disturbance when moving large rocks over long distances. Tools and materials would be confined

to the trail footprint or other previously disturbed ground. Although it is not anticipated that the project would require the use of tools other than hand tools, unforeseen trail design obstacles may require the use of blasting and/or motorized equipment. To facilitate the implementation of mitigation measures outlined in this document, the Trail Supervisor would coordinate with the Park's Science and Resources Division before using tools other than hand tools.

Materials to be used to gain elevation and prevent erosion on the new trail alignment would be local natural materials and may include rock, soil, and juniper logs. These materials are consistent with materials used throughout the High Chisos Trail System. Some rock features would be needed to gain elevation mid-way by the first rock point overlook, which would include retaining walls, checks, and water bars. Features such as these may also be used as necessary throughout the trail to control erosion and/or protect resources. To ensure that the new trail alignment is consistent with natural surroundings, trail features would be used only where needed to maintain a sustainable design and to protect resources.

Realignment Description

From the Pinnacles Pass area, the first vertical section of the existing Emory Peak Trail begins at an elevation of approximately 6,940 feet (2,115 meters) above mean sea level (msl) and climbs straight up a drainage. This segment of the trail would be bypassed to the west where the new trail alignment would start at an elevation of approximately 7,000 feet (2,134 meters) above msl and follow contour lines at an average 5-6% grade climb (3-3.5 degree slope) to a point where it intersects the existing trail and crosses a drainage. The new trail alignment would follow natural grade when crossing the drainage to avoid creating disruptions in natural drainage patterns. No other segments of the new trail alignment would cross a drainage. From this point the existing trail climbs up a ridgeline and into another drainage. The realignment would bypass this segment by continuing east and following terrain contours on an average 8% grade climb (4.5 degree slope) around a knob then inside the bowl of the peak where it would have an east aspect. The realignment would then turn back eastward to a rock point overlook with impressive views. From this overlook, the new trail would turn back westward forming a switchback that crosses the existing trail and continues on to another rock point overlook with a view of the Chisos Basin and Window View areas. From there, the next climbing switchback would turn back east and cross the existing tail again then follow contour lines around a small knob to meet up with the upper 0.42 mile (0.68 kilometer) Emory Peak Trail, which has previously been stabilized and hardened with extensive rock work.

This description of the realignment is based on preliminary designs and best information available at the time of this writing. Specific distances, areas, and layouts used to describe the Proposed Action are only estimates and could change during final site design. If changes during final site design are not consistent with the intent and effects of the selected alternative, then the Trail Supervisor would coordinate with the Park's Science and Resources Division, and additional compliance would be completed, as appropriate.

Rehabilitation of the Existing Trail

All sections of the existing trail that would be bypassed by the new trail alignment would no longer be used and they would be fully rehabilitated with erosion checks and recontouring to natural slope. As part of the Proposed Action, materials removed to create the new trail segments would be used to fill severely eroded areas of the existing damaged trail. Additional materials for rehabilitating eroded segments of the existing trail would be obtained from areas where eroded materials from the existing trail, including silt runoff, has pooled in areas along the existing trail. Following recontouring, the rehabilitated areas would be revegetated with native seeds. Jute matting would be used to stabilize the rehabilitated trail to prevent soil erosion while vegetation is established. Some of the native plants removed from the new trail alignment would be replanted in the area of the rehabilitated trail, especially in areas where the old and new trails intersect, to prevent visitor use on the rehabilitated trail while vegetation is established. The Trails Supervisor would coordinate with the Park's Botanist in revegetation efforts.

Figure 2 – The No Action Alternative: Photograph Illustrating Existing Hazardous Trail Conditions.

Figure 3 – The No Action Alternative: Photograph Illustrating Existing Erosion Problems.

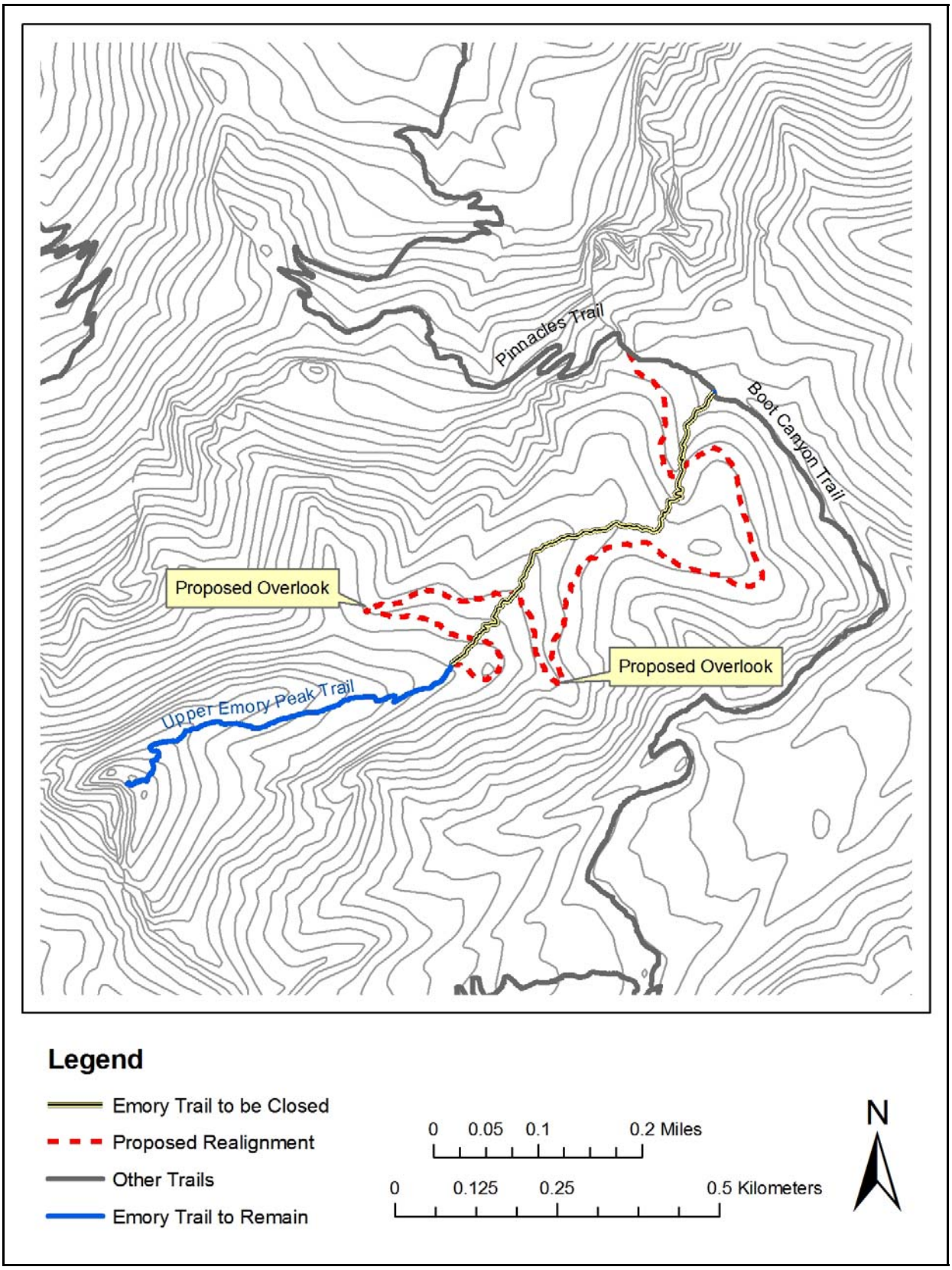

Figure 4 – The Proposed Action – Map Showing the Existing and Proposed Trail Alignments.

Alternative Considered but Dismissed

The CEQ regulations implementing NEPA require that federal agencies "…use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment" (40 CFR 1500.2 (c)), and briefly discuss reasons for eliminating alternatives from detailed study (40 CFR 1500.14 (a)). The following alternative was considered, but was dismissed from further analysis. Reasons for dismissal of this alternative are provided below.

Permanent Closure of the Emory Peak Trail

During public scoping, one member of the public proposed the alternative of permanently closing the Emory Peak trail as a solution instead of having to construct a new trail alignment. This alternative was dismissed from further analysis, because it is in conflict with the Park's enabling legislation, the Park's GMP and NPS *Management Policies 2006*. The alternative of closing the Emory Peak Trail does not meet the criteria of "reasonable alternative," as defined in the CEQ regulations, because it would not "avoid or minimize adverse effects…upon the quality of the human environment." Based on initial analysis of this alternative, it was determined that closure of the Emory Peak Trail would in fact have adverse effects on visitor experience and safety, natural and cultural resources, and human health and safety. The following presents three of the goals and objectives identified in the Purpose and Need section (above), and the ways in which the alternative of closing the trail fails to meet these goals and objectives.

- Improve health and safety for visitors and staff on the Emory Peak Trail: Closing the Emory Peak Trail would cut off access to the radio repeater system. Cutting off access to the radio repeater system would make the system difficult to maintain in working order. The radio repeater system is a vital component of the Park's and other local agencies' emergency response and incident management systems, and therefore allowing the radio repeater system to fall into disrepair would greatly increase health and safety risks for Park staff and visitors throughout the Park and others in surrounding communities.

- Provide a better visitor experience on the Emory Peak Trail: Closing the Emory Peak Trail would not meet the objective of enhancing visitor experience as outlined in planning and policy documents and the Park's enabling legislation. Because Emory Peak summit is the highest point in the Park, it offers an unparalleled recreational experience, and maintaining access to it would be consistent with the Park's enabling legislation. Therefore, trail closure would diminish visitor experience in the Park.

- Minimize impacts to park resources: If the new alignment were not constructed, which would provide materials for rehabilitating the eroded sections of existing trail, the existing trail would still require rehabilitation, and this would involve bringing in fill materials from outside sources. The Trails Maintenance Program has previously determined that bringing foreign material into the Emory Peak area could only be accomplished by helicopter. Furthermore, introducing foreign materials into the area has the potential to introduce non-native/invasive plant species and soils that may not be conducive to reestablishing native vegetation in rehabilitated areas. Therefore trail closure and rehabilitation would not sufficiently meet resource protection goals. Because it would not be feasible to rehabilitate the existing trail, and erosion would continue to degrade the ground surface in the area of the existing trail, such erosion could cause undercutting and general slope wash, which would continue to impact natural resources and possibly cultural resources.

The trail closure would be in conflict with visitor use and experience goals, resource protection goals, and health and safety goals. Therefore, this alternative was dismissed because it only partially meets the purpose and need for the project and is in conflict with overall Park objectives.

Mitigation Measures for the Proposed Action

The following mitigation measures have been developed to minimize the degree and/or severity of adverse effects, and would be implemented during all activities associated with the Proposed Action, as needed:

- To minimize the amount of ground disturbance, staging and stockpiling areas would be located in previously disturbed areas, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following construction.

- Revegetation efforts would strive to reconstruct the natural spacing, abundance, and diversity of native plant species in the rehabilitated existing trail alignment. No foreign materials with the potential to introduce exotic plant species would be brought into the area.

- The Trails Supervisor would coordinate with the Park's biologists if vegetation clearing required the removal of more than a few small trees. To reduce the amount of vegetation trampling, the trail crew would limit work to a use corridor of within six feet of each trail footprint to the extent possible.

- Park-listed sensitive plants near the proposed project area would be flagged for avoidance prior to the start of trail work. Park biologists would collect seeds from sensitive plant species in the project area for a seed bank, and some of these seeds may be used in revegetating the area of the existing trail.

- All crew members and volunteers assisting in the trail work efforts would be educated about the importance of avoiding impacts to sensitive resources that have been flagged for avoidance, which may include sensitive plants and cultural resources.

- Because disturbed soils are susceptible to erosion until revegetation is successfully established, standard erosion control measures such as jute matting would be used as necessary to minimize any potential soil erosion.

- To maintain visitor use of the Emory Peak trail during construction, segments of the existing trail would be closed only after new trail segments that bypass them have been constructed and are usable.

- To reduce the potential for interactions between humans and black bears, the crew would be provided bear-proof food storage containers, and they would be educated about the importance of using these storage containers.

- Although it is not anticipated that blasting or motorized equipment would be required to accomplish this project, mitigation measures have been developed for blasting, should this technique be needed during the implementation of the Proposed Action. The Trail Supervisor would coordinate with the Division of Sciences and Resources prior to conducting blasting or using motorized equipment. To avoid disturbance to the Mexican long-nosed bat caused by surface vibrations associated with blasting, no blasting would be conducted between May 1 and August 31. To avoid effects to wilderness values, blasting would not be conducted during periods of high visitor use such as weekends and holidays.

- Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of discovery and the Park would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, *Post Review Discoveries*. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.

- According to NPS *Management Policies 2006*, the NPS would strive to construct the trail with a sustainable design to minimize potential environmental impacts. Development would not compete with or dominate Park features, or interfere with natural processes, such as the seasonal migration of

wildlife or hydrologic activity. To the extent possible, the design and management of the trail would emphasize environmentally sensitive construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings.

Alternative Summaries

Table 1 summarizes the major components of the Proposed Action and the No Action Alternative, and it compares the ability of these alternatives to meet the project objectives, which are identified in the *Purpose and Need* chapter of this document. As shown in the following table, the Proposed Action meets each of the objectives identified for this project, while the No Action Alternative does not address any of the objectives.

Table 1 – Alternatives Summary and Extent to which Each Alternative Meets Project Objectives

No Action Alternative	Proposed Action – Trail Realignment
A trail realignment would not be constructed and the ground surface of the existing trail would not be rehabilitated. The existing trail would continue to be used as it is now, and it would likely continue to degrade due to the unfeasibility of maintaining the existing trail.	A new trail alignment would be constructed that meets sustainable trail design and safety standards. The footprint of the existing trail would be filled in with native natural materials, recontoured to natural grade, and revegetated to stabilize the ground surface.
Meets Project Objectives?	**Meets Project Objectives?**
No. Continuing the existing conditions would not provide for a trail that meets current health and safety standards, because the existing trail alignment has structural deficiencies. This alternative does not meet the objective of minimizing impacts to park resources, because the existing trail would continue to erode, and resource damage would increase. This alternative does not meet visitor use and experience goals, because the existing trail is steep and difficult to hike. This alternative would not meet the goal of providing a sustainable design for the trail that would make its long-term maintenance practical, because the existing trail would continue to be impractical to maintain.	Yes. Constructing a trail realignment would improve health and safety for visitors and staff hiking the trail, because the new trail alignment would be constructed to recommended trail design standards. The new trail alignment would not be as prone to erosion as the existing trail, and therefore it would have less potential to impact Park resources. This alternative would improve visitor experience by making the Emory Peak trail less difficult to travel. This alternative would provide a new sustainable trail design that would reduce efforts needed to maintain the trail in a safe and serviceable condition.

Table 2 summarizes the anticipated environmental impacts of each alternative. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts. Effects presented below are the net effects of all actions and conditions associated with each alternative

Table 2 – Environmental Impact Summary by Alternative

Impact Topic	No Action Alternative	Proposed Action – Trail Realignment
Soils	Continued erosion of the trail would have direct and indirect, localized, moderate, long-term, adverse impacts on soils.	Improved drainage and reduced erosion would have direct and indirect, localized, moderate, long-term, beneficial effects on soils.
Water Resources	Continued erosion of the trail and sediment export would have direct and indirect, localized, moderate, long-term, adverse impacts on water resources.	Improved drainage and reduced sediment export to riparian habitat would have direct and indirect, localized, moderate, long-term, beneficial effects on water resources.
Special Status Species	Continued erosion of the would undercut soils that may support sensitive plants, and could have direct, site-specific, negligible to minor, long-term, adverse impacts on sensitive plant species.	Construction of the trail could have negligible to direct and indirect, negligible to moderate, adverse impacts on special status plant and animal species, but these effects would be localized and short-term. Mitigation measures would reduce these impacts to negligible impacts.
Visitor Experience and Safety	Continued erosion of the trail would reduce visitor enjoyment and increase safety hazards resulting in direct and indirect, localized, moderate, long-term, adverse impacts to visitor experience and safety.	The improved trail design would improve visitor enjoyment of the trail and improved safety resulting in direct and indirect, localized, moderate, long-term, beneficial impacts to visitor experience and safety.
Wilderness Values	Continued erosion of the trail would impact the natural condition of recommended wilderness and reduce visitor enjoyment of recommended wilderness resulting in direct and indirect, localized, moderate, long-term, adverse impacts to visitor experience and safety.	The improved trail design would help protect the natural condition of recommended wilderness and increase visitor enjoyment of recommended wilderness resulting in direct and indirect, localized, moderate, long-term, beneficial impacts to visitor experience and safety.

Identification of the Environmentally Preferred Alternative

The Environmentally Preferred Alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which guides the Council on Environmental Quality (CEQ). The CEQ provides direction that "[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA's Section 101:

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and

- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The No Action alternative does not meet any of the above six evaluation factors, because it retains a trail that does not meet safety standards or resource protection standards, and it does not adequately provide for public enjoyment of the areas resources. This alternative causes ongoing impacts to significant Park resources such as natural and cultural resources.

The Proposed Action to construct a trail realignment is the Environmentally Preferred Alternative, because it facilitates the best balance between public enjoyment of resources and protection and preservation of those resources. Therefore, it addresses most components of these six evaluation factors. The Proposed Action to realign a segment of the Emory Peak Trail would provide a safe and serviceable trail that enhances visitor experience, while minimizing environmental impacts to the greatest extent possible. Because the new trail alignment would follow sustainable design standards, it would be used by future generations for the enjoyment of Park resources. Rehabilitating the existing trail alignment would also mitigate ongoing resource impacts.

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Because it meets the Purpose and Need for the project, the project objectives, and is the Environmentally Preferred Alternative, the Proposed Action to realign a segment of the Emory Peak Trail is also recommended as the NPS Preferred Alternative. For the remainder of the document, the Proposed Action to realign the Emory Peak Trail will be referred to as the Preferred Alternative.

ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental consequences, or impacts, that would occur as a result of implementing the Preferred Alternative as well as potential impacts of the No Action Alternative. Impact topics analyzed for this project have been identified on the basis of federal laws and regulations, NPS Director's Orders, NPS *Management Policies 2006* (NPS 2006), and NPS knowledge of resources at Big Bend National Park. A detailed discussion of the regulatory context, affected environment, and potential impacts of each alternative on resources relevant to each topic analyzed is provided below. The discussion of regulatory context provides background on agency mandates and responsibilities with regard to each impact topic. The "affected environment" statement provides a baseline of existing conditions and general environmental context for analyzing potential impacts of each alternative.

METHODOLOGY

Topics analyzed in this chapter include soils, water resources, special status species, visitor experience and safety, and wilderness values. Direct, indirect, and cumulative effects, as well as impairment are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are listed below. Additionally, more specific impact thresholds are provided for each resource topic in the sections that follow.

- ***Type*** describes the classification of the impact as either beneficial or adverse, direct or indirect:
  - Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition
  - Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition
  - Direct: An effect that is caused by an action, occurring in the same time and place as the action
  - Indirect: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable

- ***Context*** describes the area or location in which the impact would occur.
  - Site Specific: Impacts would be restricted to the project footprint and the use corridor around the project footprint, which is defined for this project as approximately six feet on either side both the new trail alignment and the existing trail alignment to be rehabilitated.
  - Local: In the general project area, which is defined as Emory Peak and adjacent landscape features such as Boot Canyon and the High Chisos Trail System.
  - Park Wide: Includes the entire Park
  - Regional: Includes Brewster County and surrounding counties and communities, including communities across the Rio Grande River in Mexico

- ***Duration*** describes the length of time an effect would occur, either short-term or long-term:
  - Short-term impacts generally last only during construction, and the resources resume their pre-construction conditions following construction.
  - Long-term impacts last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.

- ***Intensity*** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this EA.

Cumulative Effects: The CEQ regulations (40 CFR 1508.7) require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person

undertakes such other actions." Cumulative impacts are considered for both the No Action and Preferred Alternatives.

Cumulative impacts were determined by combining the impacts of the No Action Alternative and the Preferred Alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Big Bend National Park and the surrounding region, as applicable. The geographic scope of this analysis includes actions within the High Chisos Trail System, while the temporal scope includes projects dating back to the historic era. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis:

- Radio Repeater System Operation: A radio repeater has been placed on the Emory Peak summit. The radio repeater is a permanent structure, which is located in an “exclusion zone” of the recommended wilderness area that surrounds the summit. The repeater is powered by solar power, and therefore has no associated utility infrastructure.

- Composting Toilets: Composting toilets have been placed throughout the High Chisos Trail System to protect park resources from visitor use. The toilets are set above ground and are of minimal construction. Environmental effects of the Park’s use of these facilities are generally beneficial.

- Signs: Signs are placed throughout the High Chisos Trail System for direction and safety messages only. Signs are the minimum needed for visitor safety.

- Trail Construction, Use, and Maintenance: There are approximately 15 miles of backcountry trails in the High Chisos Trail System. Trail designs are generally comprised of natural materials and blend with the natural landscape.

- Ranching: Prior to the 1940s, ranchers used parts of the Chisos Mountains for grazing cattle, goats, and sheep. Goats were grazed more than other animals in the Chisos Mountains, because they were more suited to the rough terrain.

- Mining: Prior to the 1940s, mining was conducted in a few areas in the Chisos Mountains. Very little evidence of mining is visible within the Chisos Mountains.

Impairment: NPS *Management Policies 2006* require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the National Park system, established by the NPS Organic Act of 1916 and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values. However, these laws give the NPS the management discretion to allow certain impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park. However, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute impairment if it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;

- key to the natural or cultural integrity of the park; or

- identified as a goal in the park’s general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. A determination on impairment is made in the *Conclusion* section for each of the resource topics carried forward in this chapter.

Soils

Regulatory Context and Affected Environment

Management Policies 2006 (NPS 2006) state that the NPS will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. These policies further state that "[m]anagement action will be taken by superintendents to prevent or at least minimize adverse, potentially irreversible impacts on soils. Soil conservation and soil amendment practices may be implemented to reduce impacts. Importation of off-site soil or soil amendments may be used to restore damaged sites. Off-site soil normally will be salvaged soil, not soil removed from pristine sites, unless the use of pristine site soil can be achieved without causing any overall ecosystem impairment."

The soils of the project area are identified by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) as Puerta-Madrone complex, steep. These soils are shallow to moderately deep, very cobbly and very gravelly soils found on the summits and shoulders of the Chisos Mountains at elevations above 6,000 ft (1,800 m). The Puerta and Madrone soils are intricately mixed in this soil map unit, which is generally comprised of approximately 50% Puerta soils, 35% Madrone soils, and 15% other soils and rock outcrops. Slopes can range from 8-60% grade (4.6-31.0 degrees slope), but are usually 20-45% grade (11.3-24.2 degrees slope). Both Madrone and Puerta soils are well drained and surface runoff is moderate to rapid. Permeability is moderately slow. Available water capacity for Madrone soils is low to very low, and for Puerta soils it is consistently very low. Rooting depth for Madrone soils is moderately deep and for Puerta soils it is shallow. Water erosion is a moderate hazard for this soil map unit, because of steep slopes. The NRCS-defined appropriate use categories for this soil map unit include recreation and wildlife habitat, but the NRCS notes that steep slopes and loose rocks may pose hazards for hikers.

From its junction with the Pinnacles Peak Trail at Pinnacles Pass, approximately 0.53 mile (0.85 kilometer) of the existing Emory Peak trail is poorly designed, climbing straight up drainages and ridge lines. The trail has become heavily damaged by ongoing erosion, leading to resource damage and unsafe hiking conditions. The existing Emory Peak Trail traverses steep slopes of up to a 40% gradient (22 degree slope) on the running slope of the trail, making it prone to erosion and generally difficult to navigate. Some areas of the trail have eroded to as much as 4.50 feet (1.37 meters) below natural grade. During rain events, massive water flows travel down the trail tread causing severe drainage problems and maintenance challenges. For decades, erosion from the existing trail has caused sediment export from Emory Peak to a unique and sensitive riparian habitat in Boot Canyon, which lies below the trail (pers. comm. Jeffrey Bennett, NPS Hydrologist and Physical Scientist, January 2007). The existing trail has eroded so severely that repair and maintenance of it are impractical, and the trail continues to erode as a result of foot traffic and unnatural drainage patterns created by the trail itself.

Intensity Level Definitions

Impact analyses on soils are based on NRCS data. The thresholds of change for the intensity of an impact on soils are defined as follows:

Negligible: Soils would not be affected or the effects on soils would be below or at the lower levels of detection. Any effects to soils would be slight.

Minor: The effects on soils would be detectable. Effects on soil area would be small. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.

Moderate: The effect on soil would be readily apparent and result in a change to the soil character over a relatively wide area. Mitigation measures would be necessary to offset adverse effects and they would likely be successful.

Major: The effect on soil would be readily apparent and substantially change the character of the soils over a large area in and out of the Park. Mitigation measures to offset adverse effects would be needed, they would be extensive, and their success could not be guaranteed.

The thresholds of change for the duration of an impact on soils are defined as follows:

Short-term: Soil would recover in less than three years.
Long-term: It would take more than three years for soil to recover.

Impacts of the No Action Alternative

Under the No Action alternative, the NPS would not construct a realignment of the Emory Peak Trail and there would be no management-initiated changes to the existing trail condition. The existing trail has created unnatural drainage patterns that increase erosion problems, and these erosion problems are exacerbated by foot traffic from visitors and staff using the trail. Because the existing trail cannot be maintained, and the existing soil condition is unstable, the No Action Alternative would result in continued erosion problems. These erosion problems would continue to cause sediment export, which may affect down slope soils, including the soils and the general geologic substrate of the Boot Canyon riparian area. Effects of the No Action Alternative, therefore would have direct and indirect, localized, long-term, moderate, adverse impacts on soils.

Cumulative Effects
Past and present actions affecting local soils in the Chisos Mountains have included limited historic ranching and construction and maintenance of the High Chisos Trail System. Past ranching and problem areas of trails have altered soils and caused minor to moderate soil loss through erosion throughout the general area of the Chisos Mountains. With the exception of the Preferred Alternative, there are no present or reasonably foreseeable future projects that would have measurable effects on soils at the local level. Overall, the cumulative effects of past and present actions on soils are direct and indirect, localized, both short-term and long-term, minor effects, which have generally been adverse. The continued erosion problems associated with the No Action Alternative would contribute to cumulative adverse impacts on soils at the local level.

Conclusion
The No Action Alternative would result in direct, indirect, and cumulative adverse impacts on soils from continued erosion of the existing trail, which would be minor to moderate and long-term but localized. The No Action Alternative would not cause degradation of the Park's soil resources to such an extent that this alternative's impacts would constitute impairment.

Impacts of the Preferred Alternative

Although the Preferred Alternative would cause some negligible disturbances to soils, it would ultimately have a net beneficial effect on soils. Realigning the Emory Peak Trail would require minor excavation, which would temporarily displace and disturb soils in the footprint of the new trail alignment during construction. The effects on soils from construction of the new trail alignment would be direct and adverse, but site-specific, short-term, and negligible. Conversely, rehabilitation of the existing trail would have a long-term beneficial effect on soils. Following established standards for trail rehabilitation, the existing, heavily eroded trail would be recontoured and revegetated to expedite the reestablishment of natural drainage patterns and natural vegetation cover that would help stabilize surface soils in the area of the existing trail. Soils and rock used to fill eroded areas of the existing trail would be obtained primarily from materials removed to create the new trail alignment and from silt run off from the existing trail, which

has collected in areas along the existing trail. The recontoured segments of eroded trail would be seeded with a native plant mix, and jute matting would be used to stabilize the recontoured trail segments and prevent further erosion until vegetation could be fully established. All soils and rock used to rehabilitate the existing trail would be local salvaged materials. The Preferred Alternative would not disturb ground in areas of pristine soil for the purpose of procuring materials to rehabilitate the eroded segments of existing trail. Rehabilitated segments of trail would be closed to the public to prevent any further degradation of soils from foot traffic. Rehabilitation of the existing trail would reduce the amount of soil export affecting down slope soils, including the soils and the general geologic substrate of the Boot Canyon riparian area. Rehabilitation of the eroded existing trail would result in direct and indirect, localized, long-term, moderate, beneficial effects to soils. These effects represent the only anticipated measurable changes to soils resulting from the Preferred Alternative, and therefore represent the net effects of the Preferred Alternative.

Cumulative Effects

Past and present actions affecting local soils in the Chisos Mountains have included limited historic ranching and construction and maintenance of the High Chisos Trail System. Past ranching and problem areas of trails have altered soils and caused minor soil loss through erosion throughout the general area of the Chisos Mountains. With the exception of the Preferred Alternative, there are no present or reasonably foreseeable future projects that would have measurable effects on soils at the local level. Overall, the cumulative effects of past and present actions on soils are direct and indirect, localized, both short-term and long-term, minor effects, which have generally been adverse. By correcting the most significant erosion problem in the High Chisos Trail System, the Preferred Alternative would, on balance, have a minor to moderate beneficial effect on local soils, and therefore would not contribute to the adverse cumulative impacts on local soils caused by past actions.

Conclusion

The Preferred Alternative would not contribute to cumulative adverse impacts on local soils and it would result in direct and indirect moderate, long-term, beneficial effects on soils at the local level, because soil erosion in the general project area would be reduced by rehabilitation and stabilization of the existing trail and by constructing a stable trail surface for the new trail alignment. The Preferred Alternative does not have the potential to cause impairment of the Park’s soil resources.

Water Resources

Regulatory Context and Affected Environment

Surface waters of the United States are regulated by the Clean Water Act (CWA). The purpose of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters". The CWA is the primary authority under which the U.S. Environmental Protection Agency (U.S. EPA), the Texas Commission on Environmental Quality (TCEQ), and the Army Corps of Engineers (ACOE) regulate surface effects to waters within the boundaries of Texas.

Under the authority of Section 402 of the CWA, the U.S. EPA regulates the National Pollutant Discharge Elimination System (NPDES) permitting program. In Texas, the TCEQ has been delegated the authority to administer the NPDES on behalf of the U.S. EPA. The NPDES is primarily concerned with storm water runoff from construction sites. With few exceptions, all construction projects that disturb 1 acre or more of ground surface require the project operator, including federal agency operators, to apply for an NPDES permit and prepare a storm water pollution prevention plan (EPA 1999). Under Section 404 of the CWA, the ACOE is the permitting authority that regulates discharges of dredged or fill material and excavations within waters of the United States.

There are no surface waters within or adjacent to the footprint of the existing trail or the construction use corridor of the proposed realignment. However, Emory Peak Trail sits above Boot Canyon – a deep rugged valley cut by an intermittent stream. The riparian habitat in Boot Canyon is a high elevation stream fed by Boot Spring. Much of the canyon is bedrock bottomed with little or no sediment, making it sensitive

to sediment export from up slope storm water runoff. Boot Canyon's proximity and relative lower elevation to the Emory Peak Trail make it likely that several decades of ongoing erosion of the existing trail have deposited sediments in Boot Canyon, especially during times of massive water flows caused by heavy rains.

Intensity Level Definitions

Impact analyses on water resources were based largely on information provided by the Park's hydrologist derived from a recent site visit and evaluation of the project area in consideration of the plan to realign the trail. The thresholds of change for the intensity of an impact on water resources are defined as follows:

Negligible: Neither water quality nor hydrology would be affected, nor changes would be either non-detectable or if detected, would have effects that would be considered slight, local, and short-term.

Minor: Changes in water quality or hydrology would be measurable, although the changes would be small, likely short-term, and the effects would be localized. No mitigation measure associated with water quality or hydrology would be necessary.

Moderate: Changes in water quality or hydrology would be measurable and long-term but would be relatively local. Mitigation measures associated with water quality or hydrology would be necessary and the measures would likely succeed.

Major: Changes in water quality or hydrology would be readily measurable, would have substantial consequences, and would be noticed on a regional scale. Mitigation measures would be necessary and their success would not be guaranteed.

The thresholds of change for the duration of an impact on water resources are defined as follows:

Short-term: Following project completion, recovery would take less than one year.
Long-term: Following project completion, recovery would take longer than one year.

Impacts of the No Action Alternative

Under the No Action alternative, the NPS would not construct a realignment of the Emory Peak Trail and there would be no management-initiated changes to the existing trail condition. The existing trail has created unnatural drainage patterns that increase erosion problems, and these erosion problems are exacerbated by foot traffic from visitors and staff using the trail. Because the existing trail cannot be maintained, and the existing soil condition is unstable, the No Action Alternative would result in continued erosion problems. These erosion problems would continue to cause sediment export, which may affect down slope habitats, including the riparian habitat of Boot Canyon. The No Action Alternative would have indirect, localized, long-term, minor to moderate, adverse impacts on water resources – primarily in the Boot Canyon riparian area.

Cumulative Effects
Past and present actions affecting local water resources in the Chisos Mountains have included limited historic ranching and the construction and maintenance of the High Chisos Trail System. Past ranching and problem areas of trails may have caused sediment transport into surface waters. With the exception of the Preferred Alternative, there are no present or reasonably foreseeable future projects that would have measurable effects on water resources at the local level. Overall, the cumulative effects of past and present actions on water resources are direct and indirect, localized, short-term and long-term, minor effects, which have generally been adverse. The continued sediment transport caused by erosion problems associated with the No Action Alternative would likely contribute to adverse cumulative impacts on water resources at the local level.

Conclusion
The No Action alternative has the potential to have direct, indirect, and cumulative adverse impacts on water resources, because the erosion of the existing trail is likely causing soil transport into a nearby watershed. The No Action Alternative would not cause degradation of the Park's water resources to such an extent that this alternative's impacts would constitute impairment.

Impacts of the Preferred Alternative

Realigning the Emory Peak Trail would require minor excavation, which would temporarily displace and disturb soils in the footprint of the new trail alignment during construction. The total area of ground surface that would be disturbed by the new Emory Peak Trail alignment would be approximately 0.29 acres, and therefore the project would not require a NPDES permit. Construction of the new trail alignment would have no measurable impacts on water resources. Conversely, rehabilitation of the existing trail would likely have beneficial effects on water resources. Rehabilitation of the existing trail would reduce the amount of soil export affecting surface water and associated habitats, including the riparian habitat in Boot Canyon. Rehabilitation of the eroded existing trail would result in indirect, localized, long-term, moderate, beneficial effects to water resources. These effects would represent the net effects of the Preferred Alternative.

Cumulative Effects
Past and present actions affecting local water resources in the Chisos Mountains have included limited historic ranching and construction and maintenance of the High Chisos Trail System. Past ranching and problem areas of trails have altered soils and caused minor to moderate sediment export through erosion throughout the general area of the Chisos Mountains. With the exception of the Preferred Alternative, there are no present or reasonably foreseeable future projects that would have measurable effects on water resources at the local level. Overall, the cumulative effects of past and present actions on water resources are direct and indirect, localized, short-term and long-term minor effects, which have generally been adverse. By correcting the most significant erosion problem in the High Chisos Trail System, the Preferred Alternative would, on balance, have a beneficial effect on water resources, and therefore would not contribute to the adverse cumulative impacts on local water resources.

Conclusion
The Preferred Alternative would not contribute to cumulative adverse impacts on local water resources, and it would result in indirect, moderate, long-term, beneficial effects on water resources at the local level, because water contamination from soil erosion in the general project area would be reduced by rehabilitation and stabilization of the existing trail and by constructing a stable trail surface for the new trail alignment. The Preferred Alternative does not have the potential to cause impairment of the Park's water resources.

Special Status Species

Regulatory Context and Affected Environment

Federally Listed and Other Federally Protected Species: The Endangered Species Act of 1973 (ESA), as amended, requires examination of impacts on all federally listed threatened and endangered species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) when an action authorized, funded, or carried out by the agency may affect a listed species or designated critical habitat, or is likely to jeopardize proposed species or adversely modify proposed critical habitat. The NPS *Management Policies 2006* (NPS 2006) and Director's Order 77 *Natural Resources Management Guidelines* also require the NPS to examine potential impacts to federally listed candidate species. For the purpose of this analysis, "federally listed" refers to species protected under the ESA, and "federally protected" refers to species protected under other federal laws and policies.

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. The MBTA also serves to protect environmental conditions for migratory birds from pollution or other ecosystem degradations.

The project area is located in a pinyon-juniper-woodland habitat type that is common in the Chisos Mountains. There is no designated critical habitat for any federally listed species within or adjacent to the project area. Previous survey data conducted by qualified biologists coupled with general species life history accounts indicate that all federally listed species for Brewster County either occur at lower elevation than the project area or occur in a different biotic zone than the project area. However there is one known roosting location for the federally listed, endangered Mexican long-nosed bat (*Leptonycteris nivalis*) within 0.5 mile (0.80 kilometer) from the proposed project area, and this species is known to feed on agave plants throughout the Chisos Mountains. There are four known nesting pairs of peregrine falcon (*Falco peregrinus*) in the Chisos Mountains, which are federally protected under the MBTA.

The only federally listed plant species for which pinyon-juniper-woodland is suitable habitat is the candidate species, Guadalupe fescue (*Festuca ligulata*). This species is known to occur within 0.62 mile (1 kilometer) of the proposed project area, but in more mesic habitat at lower elevation. Several researchers have previously searched for Guadalupe fescue in the Emory Peak area, and no populations of the species have been found. Based on this information, Park biologists determined that there is little or no potential for this candidate species to occur in the project area. In 2006, Park biologists completed a botanical survey and documented the results in a report that was sent to the USFWS. During public scoping for this project, the USFWS was contacted with regard to federally listed species. Additionally, mitigation measures have been developed to reduce the potential for the Preferred Alternative to impact species of concern (see the Mitigation Measures for the Proposed Action section of this document, above).

Other Species of Concern: Other species of concern include state-listed and Park-listed species. The NPS *Management Policies 2006* (NPS 2006) and Director's Order 77 *Natural Resources Management Guidelines* also require the NPS to examine potential impacts on state-listed threatened, endangered, candidate, rare, declining, and sensitive species. The state-listed black bear *(Ursus americanus)* and Park-listed mountain lion (*Puma concolor)* are known to inhabit the Chisos Mountains. The black bear is a species of concern for the Park, because human use of the area – primarily bringing food into the area – alters the bears' behavior, drawing them into contact with humans. There are no known black bear dens near the proposed project area. However, the project area is likely within foraging territory of black bears.

Park-listed sensitive plant species are known to occur in the project area, which generally include plants listed as G3/S3 or less on the Nature Conservancy list. A botanical resource survey of the project area was conducted by the Park's Botanist and three NPS biological technicians in September 2006. Eleven Park-listed sensitive plant species were found in the general project area, including one juniper species (*J. flaccida*), mountain sage (*S. regal*), Arizona sage (*S. arizonica*), veronicaleaf brickellbush (*Brickellia veronicaefolia* var. *petrophila*), cliffbrake (*Pellaea ternifolia* var. *ternifolia*), Texan candyleaf (*Stevia ovata* var. *texana*), viscid candyleaf (*Stevia viscida*), cob cactus (*Coryphantha chaffeyi*), clustered frostweed (Helianthemum glomeratum), and wingpetal (Heteroserma pinnatum). There is a known population of the Park-listed species Chisos Mountain pinweed (*Lechea mensalis*) near the existing trail. However, no new populations were identified during the survey. Future surveys for this species will be conducted during its optimum growing season in the summer.

Intensity Level Definitions

The USFWS, Southwest Region list of federally listed threatened and endangered species, and candidate species for Brewster County, Texas was examined online. State-listed and Park-listed species and species of concern that could potentially be affected by project implementation were identified through consultation with the Park's biologists. The proposed project location was compared to known listed and sensitive species distribution records and habitat types in order to assess potential impacts. The thresholds of change for the intensity of an impact on special status species are defined as follows:

Negligible: An action that would not affect any individuals of a listed or sensitive species or their habitat. No federally listed species would be affected or the alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population.

Minor: An action that would affect a few individuals of sensitive species or have very localized impacts upon their habitat within the park. The change would require considerable scientific effort to measure and have barely perceptible consequences to the species or habitat function. The alternative would affect an individual(s) of a listed species or its critical habitat, but the change would be small.

Moderate: An action that would cause measurable effects on: (1) a relatively moderate number of individuals within a sensitive species population, (2) the existing dynamics between multiple species (e.g., predator-prey, herbivore-forage, vegetation structure- wildlife breeding habitat), or (3) a relatively large habitat area or important habitat attributes within the park. A sensitive species population or habitat might deviate from normal levels under existing conditions, but would remain indefinitely viable within the park. An individual or population of a listed species, or its critical habitat would be noticeably affected. The effect could have some long-term consequence to the individual, population, or habitat. Mortality or interference with activities necessary for survival expected on an occasional basis, but not expected to threaten the continued existence of the listed species in the park.

Major: An action that would have drastic and permanent consequences for a sensitive species population, dynamics between multiple species, or almost all available critical or unique habitat area within the park. A sensitive species population or its habitat would be permanently altered from normal levels under existing conditions, and the species would be at risk of extirpation from the park. An individual or population of a listed species, or its critical habitat, would be noticeably affected with a long-term, vital consequence to the individual, population, or habitat. Mortality or other effects are expected on a regular basis and could threaten continued survival of the species in the park. A taking under Section 7 of the Endangered Species Act could occur.

The thresholds of change for the duration of an impact on special status species are defined as follows:

Short-term: Recovery would take less than one year.
Long-term: Recovery would take longer than one year.

Impacts of the No Action Alternative

Under the No Action alternative, the NPS would not construct a realignment of the Emory Peak Trail and there would be no management-initiated changes to the existing trail condition. The existing trail has created unnatural drainage patterns that increase erosion problems, and these erosion problems are exacerbated by foot traffic from hikers using the trail. Because the existing trail cannot be maintained, and the existing soil condition is unstable, the No Action Alternative would result in continued erosion problems. These erosion problems would likely spread into areas where plant species of concern could be impacted. Impacts of the No Action Alternative to wildlife species of concern would be primarily from continued human use of the trail that has the potential to draw scavenger species to the area for food that is not stored in proper containers.

Federally Listed and Other Federally Protected Species: Because there are no known federally listed or federally protected plant or animal species within or adjacent to the proposed project area, the No Action Alternative would have no effect on federally listed or federally protected species.

Other Species of Concern: Park-listed sensitive plant species are known to occur in the general area of the proposed project, including plants adjacent to the existing trail. Continued erosion of the existing Emory Peak Trail may threaten to undercut and deteriorate soils that support Park-listed sensitive plant species. The No Action Alternative would have direct, site-specific, long-term, negligible, adverse impacts on Park-listed sensitive plants.

Continued human use of the trail has the potential to draw scavenging bears to the area for food that is not stored in proper containers. This can alter black bear foraging behavior, and can pose threats to visitors from human-bear encounters. Throughout the Park, these threats are mitigated by education programs and bear-proof storage containers provided for visitors. The No Action Alternative, therefore, has the potential to have indirect, localized, long-term, negligible to minor, adverse impacts on black bears.

Cumulative Effects
Past and present actions affecting local special status species have included limited historic ranching and the construction and maintenance of the High Chisos Mountains Trail System. Past ranching and trails have changed the general vegetative structure of the Chisos Mountains, and visitor use has affected sensitive animal species that are easily disturbed by human-caused noise. Additionally, historic hunting and the introduction of invasive animal species has affected the number and variety of sensitive wildlife species in the general area.

There are no present or reasonably foreseeable future projects that would have measurable effects on federally listed or Park-listed sensitive plant species at the local level. The continued soil undercutting caused by erosion problems associated with the No Action Alternative would likely continue to contribute to adverse cumulative impacts on Park-listed sensitive plant species at the site-specific level. Continued visitor use of the existing Emory Peak Trail would likely continue to disrupt wildlife use of the project area. Overall, the cumulative effects of past and present actions on plant and wildlife species of concern are minor to moderate, localized, and include both short-term and long-term effects, which have generally been adverse. The No Action Alternative would not measurably contribute to adverse cumulative effects.

Conclusion
The No Action alternative has the potential to have minor direct, indirect, and cumulative adverse impacts on special status species, including impacts to Park-listed sensitive plants species, resulting from continued erosion of soils that may support these species. Additionally, impacts associated with black bears would result from use of the existing trail bringing scavenging bears in contact with visitors using the trail. The No Action Alternative does not have the potential to cause impairment of the Park's special status species.

Impacts of the Preferred Alternative

Rerouting the Emory Peak Trail would require minor vegetation removal in the footprint of the new trail alignment. Additionally, trampling during construction of the new trail alignment and during rehabilitation of the existing trail could cause impacts to plants in the construction use corridor, which extends approximately 6 feet out from the footprint of each trail alignment. Animal species of concern may be temporarily affected by the Preferred Alternative as a result of noise disturbance and possibly ground vibration if the project requires the use of blasting, and also by the crew spending long periods of time in the area.

Federally Listed and Other Federally Protected Species: Although it is not anticipated that the Preferred Alternative would require tools other than hand tools, unforeseen trail design obstacles may require the use of blasting and/or motorized equipment. Blasting could cause vibrations and/or noise disturbance that may travel far enough to disturb a known roost of endangered Mexican long-nosed bat (*Leptonycteris nivalis*) (pers. comm. Raymond Skiles, NPS Wildlife Biologist, January 2007). Blasting during certain times of year could have indirect, localized, short-term, minor, adverse effects to the Mexican long-nosed bat. To mitigate potential impacts on endangered bats during important reproductive periods, no blasting would be conducted between May 1 and August 31. The known peregrine falcon eyries are far enough

from the project area that they would not be impacted by blasting or any other proposed project activities. Because mitigation measures have been developed to protect the federally listed Mexican long-nosed bat during its maternity season, the project would have "no effect" on any federally listed species, as defined in the ESA. The Park's determination that the project would have "no effect" under the ESA has been documented in a botanical survey report and a letter to the USFWS. The USFWS has provided written concurrence with the Park's determination. Under NEPA, the overall potential impacts of the Preferred Alternative on federally listed and other federally protected species would be indirect, localized, short-term, negligible, and adverse.

Other Species of Concern: Park-listed sensitive plant species are known to occur in the general area of the proposed project, including plants adjacent to the existing trail. Trampling during construction of the new trail alignment and during rehabilitation of the existing trail could cause impacts to plants in the construction use corridor. To mitigate impacts to Park-listed sensitive plant species, populations of sensitive plants would be flagged for avoidance by qualified NPS botanists. Therefore, the Preferred Alternative would not have adverse impacts on Park-listed sensitive plants, because they would be avoided. Rehabilitation of the existing trail has the potential to have negligible, site-specific, long-term, beneficial effects to Park-listed sensitive plants, because it would reduce erosion that is currently undercutting soils that may support these species. Therefore, the net effects of the Preferred Alternative on Park-listed plant species would likely be no change or direct, site-specific, long-term, negligible beneficial effects.

Human use of the new trail alignment would have the same or similar effect on black bear behavior as the No Action Alternative. Human use has the potential to draw scavenging bears to the area for human food that is not stored in proper containers. This can alter black bear foraging behavior, and can pose threats to visitors from human-bear encounters. Throughout the Park, these threats are mitigated by education programs and bear-proof storage containers provided for visitors. During construction, the increased human activity associated with the trail crew spending long periods of time in the area could increase the risk of bear scavenging behavior. To mitigate this, all members of the trail crew would be educated about the importance of using bear-proof food containers, and these containers would be provided to the crew by the Park, as needed. The Preferred Alternative therefore, has the potential to have indirect, localized, short-term, negligible to minor, adverse impacts on black bears, which would not represent a measurable change in black bear behavior in the area.

Cumulative Effects

Past and present actions affecting local special status species have included limited historic ranching and the construction and maintenance of the High Chisos Mountains Trail System. Past ranching and trails have changed the general vegetative structure of the Chisos Mountains, and visitor use has affected sensitive animal species that are easily disturbed by human caused noise. Additionally, historic hunting and the introduction of invasive animal species has affected the number and variety of sensitive wildlife species in the general area.

There are no present or reasonably foreseeable future projects that would have measurable effects on federally listed or Park-listed sensitive plant species at the local level. The Preferred Alternative has the potential to have negligible beneficial impacts on special status plant species, because it would prevent continued soil undercutting caused by erosion problems associated with the existing Emory Peak Trail. Visitor use of the new trail alignment would have the same or similar impact on wildlife use of the project area as does use of the existing trail. Overall, the cumulative effects of past and present actions special status species are direct and indirect, localized, short-term and long-term, minor effects, which have generally been adverse. The Preferred Alternative would not contribute to adverse cumulative effects to special status species.

Conclusion

The Preferred Alternative has the potential to have indirect, localized, short-term, negligible, adverse impacts on the federally listed Mexican long-nosed bat *(Leptonycteris nivalis)* from vibrations and/or noise disturbance from blasting that may travel far enough to disturb a known roost of this endangered species. However, these impacts would be mitigated by restrictions on blasting during the bat's maternity season.

The Preferred Alternative has the potential to have indirect, localized, short-term, negligible, adverse impacts on Park-listed sensitive plant species from trampling during construction, but these impacts would be mitigated by flagging sensitive areas for avoidance. The Preferred Alternative has the potential to have indirect, localized, short-term, negligible, adverse impacts on black bears from trail use of the area by trail crews drawing scavenging bears to the area, but these impacts would be mitigated by education and the use of bear-proof food storage containers. The Preferred Alternative would have the same impacts associated with black bears as the existing trail, which results from use of the area bringing scavenging bears in contact with visitors using the trail. The net effects of the Preferred Alternative on special status species would be direct and indirect, localized, short-term, negligible, and adverse. The Preferred Alternative does not have the potential to cause impairment of the Park's special status species.

Visitor Experience and Safety

Regulatory Context and Affected Environment

According to NPS *Management Policies 2006* (NPS 2006), the enjoyment of park resources and values by people is part of the fundamental purpose of all park units. The NPS is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks. Within the parks, NPS maintains an atmosphere that is open, inviting, and accessible to all. Further, the NPS provides opportunities for forms of enjoyment that are uniquely suited and appropriate to the exceptional natural and cultural resources found in the parks. The NPS *Management Policies 2006* (NPS 2006) also states that scenic views and visual resources are considered highly valued associated characteristics that the NPS should strive to protect.

Big Bend National Park was created by an act of Congress "for recreational park purposes…[and]…for the benefit and enjoyment of the people." The Park typically receives between 300,000 and 400,000 visitors every year. Approximately 80% of visitors use the Park's trails – the majority of the trails being in the High Chisos Mountains. The High Chisos Trail System is comprised of over 15 miles of trails above the Chisos basin developed area. The trail system is open year-round and encompasses 42 camp sites. Emory Peak Trail is one of the most popular and heavily used destination hikes in Big Bend National Park. Emory Peak Trail is used daily throughout the entire year, including the warmer times of the year when visitation levels drop in other areas of the Park, but the high elevation Chisos Mountains offer a cooler hiking experience. From the Chisos Basin developed area, hikers travel 3.5 miles (5.6 kilometers) along the Pinnacles Trail then another 0.90 miles (1.45 kilometers) up the Emory Peak Trail to the summit. At 7,832 feet (2,387 meters) above mean sea level, the Emory Peak summit is the highest point in the Park and the ninth highest point in Texas. The Emory Peak summit offers unrivaled 360-degree views of the surrounding landscape. On a clear day, for instance, one can see the mountains of Mexico across the border to the south and to the north the McDonald Observatory is visible over 100 miles away in the Davis Mountains. At times the Emory Peak Trail accommodates single groups comprised of over 50 people, each challenging the 8.8 mile (14.16 kilometer) arduous roundtrip hike from the Basin to the summit and back. Backpackers with the appropriate permit can stay overnight at a small campsite on Emory Peak that accommodates up to six people. Many visitors are drawn to stay the night in the Chisos Mountains by the unparalleled view of what is probably the most pristine night sky of any national park in the contiguous 48 states (pers. comm. Raymond Skiles, NPS Wildlife Biologist and Wilderness Coordinator, January 2007).

The Emory Peak trail is the only access to the Emory Peak summit. In addition to offering a unique visitor experience, the summit is also the location for a radio repeater system, which provides a means of communication for Park staff and medics as well as other agencies such as the International Boundary Water Commission, U.S. Customs and Border Protection the Texas Department of Public Safety, and the Brewster County Sheriff. Because much of Brewster County is so remote, with little infrastructure, radios are often the only way for local agencies and medical personnel to communicate during emergency response and incident management operations. The radio repeater system is powered by batteries attached to a solar array, which must be accessed periodically for maintenance. Therefore maintaining

safe access to the Emory Peak summit is important not only for visitors but for Park staff and other agencies concerned with safety.

Because the existing trail is poorly designed, it is hazardous and difficult for hikers to navigate. There have been multiple trail related injuries attributed to tread degradation, which causes poor footing. On average, visitors report 2-3 injuries a year – typically sprained and broken ankles. The existing Emory Peak Trail has degraded to a point that repairing and maintaining it are no longer feasible (pers. comm. Don Sharlow, NPS Trails Supervisor, January 2007).

Intensity Level Definitions

The methodology used for assessing impacts to visitor experience and safety is based on how the No Action Alternative and Preferred Alternative would affect the visitor and local safety operations, particularly with regards to the visitors' enjoyment of the Park's primary resources and emergency response operations of local agencies. The thresholds for this impact assessment are as follows:

Negligible: Visitors would not be affected or changes in visitor experience and/or safety would be below or at the lowest level of detection. Any effects would be short-term. The visitor would not likely be aware of the effects associated with the alternative.

Minor: Changes in visitor experience and/or safety would be detectable, although the changes would be slight and likely short-term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate: Changes in visitor experience and/or safety would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

Major: Changes in visitor experience and/or safety would be readily apparent and have substantial long-term consequences. The visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

Impacts of the No Action Alternative

The No Action Alternative may ultimately have measurable adverse effects on visitor experience and safety. Although the existing trail alignment would continue to be used, frequent maintenance episodes would be required to address ongoing erosion problems, which would be costly and time consuming, and which are currently unfeasible. Severe weather conditions would cause the trail to become more heavily eroded, possibly resulting in segments of the trail being unusable. Should the No Action Alternative be selected, the NPS would make all attempts to respond to future needs and conditions of the trail without major actions or changes in present management direction. However, because funding and environmental limitations would likely continue to prevent the appropriate maintenance of the trail, the Park may have to consider emergency trail closure when trail conditions pose severe risks to human safety and/or Park resources. The No Action Alternative has the potential to have direct, long-term, moderate, adverse impacts on visitor use and experience.

Cumulative Effects

Past and present actions affecting visitor experience and safety in the Chisos Mountains have included the construction and maintenance of the High Chisos Trail System and its associated features such as composting toilets, signs, designated campsites, and food storage lockers. With the exception of the Preferred Alternative, there are no present or reasonably foreseeable future projects that would have measurable effects on visitor experience and safety at the local level. Overall, the cumulative effects of past and present actions on visitor experience and safety are moderate to major, localized, and long-term effects, which have generally been beneficial. The No Action Alternative would not contribute to beneficial

cumulative effects, because it would likely result in adverse impacts on visitor experience and safety at the local level.

Conclusion
The No Action alternative has the potential to have direct, indirect, and cumulative adverse impacts on visitor experience, which would be long-term and localized. Impacts to visitor experience would result from continued degradation of one of the Park's most popular visitor attractions – the Emory Peak Trail.

Impacts of the Preferred Alternative

The Preferred Alternative would have moderate to major beneficial effects on visitor experience and safety at the site-specific level and minor to moderate beneficial effects on visitor experience at the local level. The new trail design would have an average gradient of 7% (4 degree slope) making it easier, safer, and more enjoyable for hikers to navigate. In contrast to the existing trail, which climbs up steep drainages and along ridgetops, the proposed new trail would follow natural terrain contours, meandering along areas of Emory Peak that offer superior views to the existing trail. The new alignment would offer rock outcrop overlook points for hikers to rest and/or take in the views. Although construction activities have the potential to impact visitor use through construction related noise, mitigation measures have been developed to ensure that there would be little or no disruption in visitor use of the area during trail construction. Segments of the existing trail would not be closed to visitors until segments of the new alignment were completed and usable. Additionally, although it is not anticipated that the Preferred Alternative would require tools other than hand tools, unforeseen trail design obstacles may require the use of blasting and/or motorized equipment, which may cause excessive noise in the area. Use of these trail construction techniques would be planned to avoid times of high visitation such as weekends and holidays. Therefore, during construction it is anticipated that the Preferred Alternative would have direct and indirect, localized, short-term, negligible to minor adverse effects, but that this alternative would ultimately result in a net beneficial effect that would be direct and indirect, localized, long-term, and moderate.

Cumulative Effects
Past and present actions affecting visitor experience and safety in the Chisos Mountains have included the construction and maintenance of the High Chisos Trail System and its associated features such as composting toilets and signs. With the exception of the Preferred Alternative, there are no present or reasonably foreseeable future projects that would have measurable effects on visitor experience and safety at the local level. Overall, the cumulative effects of past and present actions on visitor experience and safety are moderate to major, localized, and long-term effects, which have generally been beneficial. The Preferred Alternative would contribute to beneficial cumulative effects on visitor experience and safety at the local level.

Conclusion
The Preferred Alternative has the potential to have direct, indirect, and cumulative beneficial impacts on visitor experience and safety, which would be long-term and localized. Beneficial effects on visitor experience would result from the new trail providing a safer and more enjoyable hiking experience on Emory Peak.

Wilderness Values

The Wilderness Act of 1964 (16 U.S.C. 1131 *et seq*) authorized Congress to designate undeveloped, roadless areas of 5,000 acres or more to be set aside as wilderness "for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness." Wilderness areas are places " where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean…Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which… generally appears to have been affected primarily by the forces of nature, with the imprint of man's work

substantially unnoticeable[,] has outstanding opportunities for solitude or a primitive and unconfined type of recreation[,]…and…may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." (16 U.S.C. 1131 et seq). The two central directives of the Wilderness Act are: 1) providing for public enjoyment of these areas; and 2) protecting natural resources. The Wilderness Act prohibits the use of mechanized transport or motorized equipment in designated wilderness areas, unless absolutely necessary. The Wilderness Act requires federal agencies to ensure that wilderness areas retain their wilderness character by minimizing human-made structures and by preserving the natural condition of the land. Federal agencies have recognized that the balance between public enjoyment and resource protection is a delicate one, and therefore trails and their associated features are very common in wilderness areas, because they serve to minimize resource damage while providing for visitor use and enjoyment of wilderness areas. With regard to trail maintenance in wilderness areas, the NPS *Management Policies 2006* state: "Trail maintenance structures (such as water bars, gabions) may be provided, under minimum requirement protocols, where they are essential for resource preservation or where significant safety hazards exist during normal use periods."

The Park has 538,000 acres of wilderness that were recommended to Congress for wilderness designation in 1978. The Park's 2004 GMP studied lands added to the park since then, and found an additional 62,400 acres as eligible for further study in the North Rosillos and Nine Point units. The Emory Peak Trail project area is in the High Chisos Trail System, which is located with the area recommended for wilderness designation in 1978. The project area is characterized by areas of intact vegetation and habitat where natural processes prevail, and where the imprint of man's work – including trails, signs, and non-permanent restrooms – are significantly unnoticeable. The area provides some opportunities for solitude and a primitive, unconfined recreation. Until Congress acts on the 1978 recommendation for wilderness designation, the Park manages recommended wilderness areas as wilderness. As such, the Park's standard operating procedures include applying the minimum requirement concept, such as the tools provided in "Minimum Management Decision Guide," developed by the Arthur Carhart National Wilderness Training Center (revised 2005), which sets the interagency standard for managing wilderness. NPS Management Policies 2006 (NPS 2006) state: "All management decisions affecting wilderness must be consistent with the minimum requirement concept. This concept is a documented process used to determine if administrative actions, projects, or programs undertaken by the Service or its agents and affecting wilderness character, resources, or the visitor experience are necessary, and if so how to minimize impacts. The minimum requirement concept will be applied as a two-step process that determines whether the proposed management action is appropriate or necessary for administration of the area as wilderness and does not cause a significant impact to wilderness resources and character, in accordance with the Wilderness Act; and the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized."

Intensity Level Definitions

The methodology used for assessing impacts to wilderness values is based on how the No Action and Preferred Alternatives would affect the wilderness resources and the wilderness experience, particularly with regard to the visitors' enjoyment and preservation of the natural condition of a recommended wilderness area. The thresholds for this impact assessment are as follows:

Negligible: Neither the natural condition of recommended wilderness lands, nor visitor use and enjoyment of recommended wilderness lands would be affected, or changes in wilderness character or wilderness experience would be below the level of detection. Any effects would be short-term. Wilderness visitors would not likely be aware of the effects associated with the alternative.

Minor: Changes in the natural condition of recommended wilderness lands or visitor use and enjoyment of recommended wilderness lands would be detectable, although the changes would be slight and likely short-term. The wilderness visitor would be aware of the effects associated with the alternative, but the effects would be slight.

Moderate: Changes in the natural condition of recommended wilderness lands or visitor use and

enjoyment of recommended wilderness lands would be readily apparent and likely long-term. The wilderness visitor would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.

Major: Changes in the natural condition of recommended wilderness lands or visitor use and enjoyment of recommended wilderness lands would be readily apparent and have substantial long-term consequences. The wilderness visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

Impacts of the No Action Alternative

Because the trail serves as a means for visitor use and enjoyment of a recommended wilderness area, its maintenance and/or realignment is important to preserving wilderness values. The No Action Alternative would continue to have measurable adverse impacts on the natural condition of the land in the footprint of the existing trail, but adverse impacts to the overall wilderness character of the local area would be negligible. Although the existing trail alignment would continue to be used, frequent maintenance episodes would be required to address ongoing erosion problems, which would be costly and time consuming, and which are currently unfeasible. Severe weather conditions would cause the trail to become more heavily eroded, possibly resulting in segments of the trail being unusable. Should the No Action Alternative be selected, the NPS would make all attempts to respond to future needs and conditions of the trail without major actions or changes in present management direction. However, because funding and environmental limitations would likely continue to prevent the appropriate maintenance of the trail, the Park may have to consider emergency trail closure when trail conditions pose severe risks to human safety and/or Park resources. The No Action Alternative has the potential to have direct and indirect, localized, long-term, minor to moderate, adverse impacts on the natural condition of recommended wilderness lands and visitor use and enjoyment of recommended wilderness lands.

Cumulative Effects

Past and present actions affecting wilderness values in the Chisos Mountains have included limited historic ranching and the construction and maintenance of the High Chisos Trail System and its associated features such as composting toilets and signs. Although placing human-made features such as composting toilets and signs within wilderness contributes to the appearance of a human presence in the area, these features service the needs of visitors using recommended wilderness areas and they also help protect the natural condition of recommended wilderness areas. Therefore the net effect of these features is negligible and generally beneficial. The main adverse effect on the natural condition of this recommended wilderness area would be the alteration of the natural condition of the area resulting from ranching. The effects of historic ranching on wilderness values, however is negligible. With the exception of the Preferred Alternative, there are no present or reasonably foreseeable future projects that would have measurable effects on wilderness values at the local level. Overall, the cumulative effects of past and present actions on wilderness values are negligible, localized, and long-term effects, which have been both beneficial and adverse. The No Action Alternative would contribute to adverse impacts on natural conditions and visitor use and enjoyment of recommended wilderness at the local level, because it would result in the continued degradation of natural resources and a visitor use landscape feature.

Conclusion

The No Action alternative has the potential to have direct, indirect, and cumulative adverse impacts on wilderness values, which would be long-term and localized. Adverse impacts would result from continued degradation of the natural wilderness character of the project area, which are primarily associated with erosion. The No Action Alternative does not have the potential to cause impairment of the Park's wilderness values.

Impacts of the Preferred Alternative

To the greatest extent possible, no motorized equipment or mechanized transport would be used in the construction of the new trail alignment or in the rehabilitation of the old trail alignment. Trail maintenance structures would be the minimum needed to accomplish the project and would be constructed of local materials to minimize the appearance of human-made features on the landscape. The preferred alternative would have a beneficial effect on the wilderness character of the project area, because the new trail alignment would be designed to harmonize with the natural wilderness character, and the rehabilitation of the existing trail would correct erosion conditions that disrupt natural processes and cause degradation of the overall wilderness character in the footprint of the existing trail and adjacent land. Although it is not anticipated that the Preferred Alternative would require tools other than hand tools, unforeseen trail design obstacles may require the use of blasting and/or motorized equipment. If motorized or mechanized equipment (generally prohibited within wilderness) is considered for use during construction, it would be analyzed using the minimum requirements concept:"

Because all work would likely be conducted in a manner consistent with wilderness values, it is anticipated that the Preferred Alternative would have only indirect, localized, short-term, negligible adverse impacts on wilderness values. Ultimately, however, the Preferred Alternative would have direct, moderate, beneficial effects on wilderness values at the site-specific level and minor beneficial effects on wilderness values at the local level. The reduced footprint of the new trail relative to the existing trail would decrease the appearance of human-made alterations of the landscape and help reestablish natural conditions in the area of the existing trail. The new alignment would offer rock outcrop overlook points for hikers to rest and/or take in the views of the recommended wilderness area. The trail would not be visible to people other than those actively using the trail, and therefore would not interfere with the visual character of wilderness lands.

Although construction activities have the potential to impact visitor use and enjoyment of recommended wilderness lands through construction related noise, mitigation measures have been developed to ensure that there would be little or no disruption in visitor use of the recommended wilderness area during trail construction. Segments of the existing trail would not be closed to visitors until segments of the new alignment were completed and usable. Additionally, if the project should require blasting and/or the use of motorized equipment, these activities would be planned to avoid times of high visitation such as weekends and holidays. Therefore, during construction it is anticipated that the Preferred Alternative would have direct and indirect, localized, negligible to minor, short-term adverse effects on wilderness values at the local level, but that this alternative would ultimately result in a net beneficial effect that would be direct and indirect, site-specific, moderate, and long-term.

Cumulative Effects

Past and present actions affecting wilderness values in the Chisos Mountains have included limited historic ranching and the construction and maintenance of the High Chisos Trail System and its associated features such as composting toilets and signs. Although placing human-made features such as composting toilets and signs within wilderness contributes to the appearance of a human presence in the area, these features service the needs of visitors using recommended wilderness areas and they also help protect the natural condition of recommended wilderness areas. Therefore the net effect of these features is negligible and generally beneficial. The main adverse effect on the natural condition of this recommended wilderness area would be the alteration of the natural condition of the area resulting from ranching. The effects of historic ranching on wilderness values, however is negligible. With the exception of the Preferred Alternative, there are no present or reasonably foreseeable future projects that would have measurable effects on wilderness values at the local level. Overall, the cumulative effects of past and present actions on wilderness values are negligible, localized, and long-term effects, which have been both beneficial and adverse. The Preferred Alternative would contribute to beneficial effects on

natural conditions and visitor use and enjoyment of recommended wilderness at the local level, because it would result in the protection of natural resources and an improved visitor use feature.

Conclusion

The Preferred Alternative has the potential to have direct, indirect, and cumulative beneficial effects on wilderness values, which would be long-term and localized. Beneficial effects to wilderness values would result from restoring the natural character of the footprint of the existing trail and from constructing the new trail alignment in to harmonize more with the natural wilderness character of the area. The Preferred Alternative does not have the potential to cause impairment of the Park's wilderness values.

CONSULTATION AND COORDINATION

External Scoping

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposed trail realignment, and to generate input relevant to the preparation of this EA. The scoping letter dated August 17, 2006 was mailed to 61 state and federal agencies, special interest groups, and individuals. In addition, the scoping letter was mailed to the Park's seven affiliated Native American tribes. Scoping information was also posted on the Park's website.

During the 30-day scoping period, five responses were received. One individual suggested that the NPS should consider trail closure as an alternative. This alternative was examined by the interdisciplinary team and ultimately dismissed as not meeting the objectives of the Preferred Alternative, because visitor experience would be diminished, access to the radio repeater system would be cut off, and closure would require a major and costly rehabilitation effort to mitigate ongoing natural and cultural resource degradation associated with the existing trail. The remaining responses included some in favor of the project and some requesting more information. Copies of response letters from state, federal, and international agencies follow. Other responses are on file in the Park's Science and Resource Division compliance files.

International Boundary and Water Commission Response

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INTERNATIONAL BOUNDARY AND WATER COMMISSION
UNITED STATES AND MEXICO

OFFICE OF THE COMMISSIONER
UNITED STATES SECTION

SEP 0 5 2006

Vidal Davila
Acting Superintendent
Big Bend National Park
P.O. Box 129
Big Bend National Park, Texas 79834

Subject: Emory Peak trail realignment proposal

Dear Mr. Davila:

The International Boundary and Water Commission, United States Section (USIBWC) has received your letter dated August 17, 2006 announcing your intent to prepare an environmental assessment (EA) to realign the Emory Peak trail in Big Bend National Park. The National Park Service (NPS) intends to realign 1.21 miles of the Emory Peak trail starting from the Pinnacles Pass area. The realignment will follow terrain contours to reduce the grade of the trail and reduce erosion of the natural surface. The letter also states that the NPS intends to rehabilitate the old trail.

The USIBWC feels that this is a worthwhile project and applauds the NPS for their efforts in promoting preservation of our environmental resources. The USIBWC has no comments at this time but does look forward to receiving the draft EA for review and comment.

If you need additional help or information, please contact Wayne Belzer at (915) 832-4703.

Sincerely,

Gilbert G. Anaya
Supervisory Environmental Protection Specialist
Environmental Management Division

The Commons, Building C, Suite 100 • 4171 N. Mesa Street • El Paso, Texas 79902
(915) 832-4100 • (FAX) (915) 832-4190 • http://www.ibwc.state.gov

US Fish and Wildlife Service Response Number 1

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974

AUG 31 2006

Vidal Davila
Big Bend National Park
P.O. Box 129
Big Bend National Park, TX 79834

Consultation Number 21450-2006-TA-0226

Dear Mr. Davila:

This responds to your scoping letter dated August 17, 2006, requesting comments on the proposed Emory Peak trail realignment project in Big Bend National Park (Park), Brewster County, Texas. Below are the U.S. Fish and Wildlife Service (Service) recommendations regarding threatened and endangered species that may be affected by this project.

Enclosed is a list of species to consider when evaluating project activities at the Park. Please consider these potential impacts in your analysis. We are providing this information to assist you and the Park in assessing and avoiding impacts to federally listed threatened and endangered species, their habitat, and designated wetlands.

Federally listed species

The proposed project site is not located within designated critical habitat of any federally listed threatened or endangered species. You may access a list of federally listed or proposed species by county of occurrence in Texas at http://www.fws.gov/ifw2es/EndangeredSpecies/lists/. A searchable database with information related to the life history and ecology of each of these species can be found at http://endangered.fws.gov/.

Generally, the Service believes that the first step in determining impacts to endangered species is presence/absence surveys conducted within the project area by persons with appropriate biological expertise. Often, absence of endangered species is determined and the project can then proceed without additional responsibilities under the Endangered Species Act of 1973, as amended (Act). If assessments indicate that suitable habitat is likely to be affected either directly or indirectly, we recommend that you consult with us further. If any endangered species or their habitats are present, the project can often be modified to avoid all impacts. Please send any completed surveys or habitat assessments to our office for assistance in evaluating potential effects.

TAKE PRIDE IN AMERICA

If impacts cannot be avoided, we recommend that the Park pursue formal consultation through section 7 of the Act. Section 7 requires that all Federal agencies consult with the Service to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy critical habitat of such species. It is the primary responsibility of the Park, as the Federal action agency, to determine whether any action it authorizes, funds, or carries out may affect a federally listed or proposed species.

Candidate Species

We also recommend that you review the potential for your project to affect candidates. Candidate species are those that are being considered for possible addition to the threatened and endangered species list. There is sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but higher priority listings currently preclude issuance of a proposed rule for those species. Candidate species currently have no legal protection. If you find your project may potentially impact these species, the Service would like to provide technical assistance to help avoid or minimize adverse effects. Addressing these species at this stage could better provide for overall ecosystem health in the local area and may avert potential future listing.

State-listed species

The State of Texas also protects certain species of plants and animals. Contact the Texas Parks and Wildlife Department (Endangered Resources Branch), Fountain Park Plaza Building, Suite 100, 3000 South IH-35, Austin, Texas 78704 (512-912-7011) for information concerning fish, wildlife, and plants of State concern.

Wetlands and Native Habitats

If your project will involve filling, dredging, or trenching of a wetland or riparian area it may require a Section 404 permit from the U.S. Army Corps of Engineers. For permitting requirements under Section 404 of the Clean Water Act, please contact the Fort Worth District, Permits Section, CESWF-EV-0, P.O. Box 17300, Fort Worth, Texas, 76102-0300, 817-978-2681.

Wetlands and riparian zones provide valuable fish and wildlife habitat as well as contribute to flood control, water quality enhancement, and groundwater recharge. Wetland and riparian vegetation provides food and cover for wildlife, stabilizes banks, and decreases soil erosion. These areas are inherently dynamic and very sensitive to changes caused by such activities as overgrazing, logging, major construction, or earth disturbance. Construction activities near such areas should be carefully designed to minimize impacts. If vegetation clearing is needed in riparian areas, these areas should be revegetated with native wetland and riparian vegetation to prevent erosion or loss of habitat. We recommend minimizing the area of soil scarification and initiating incremental reestablishment of herbaceous vegetation at the proposed work sites. Denuded and/or disturbed areas should be revegetated with a mixture of native legumes and grasses. Species commonly used for soil stabilization are listed in the Texas Department of

Agriculture's (TDA) Native Tree and Plant Directory, available from TDA at P.O. Box 12847, Austin, Texas, 78711.

We also urge you to take all precautions to ensure sediment loading does not occur to receiving streams in the project area. To prevent and/or minimize soil erosion and compaction associated with construction activities, avoid any unnecessary clearing of vegetation, and follow established rights-of-way whenever possible. All machinery and petroleum products should be stored outside the floodplain and/or wetland area during construction to prevent possible contamination of water and soils. No permanent structures should be placed in the 100-year floodplain.

We thank you for your concern for endangered and threatened species and other natural resources, and we appreciate the opportunity to comment on the proposed project. Should you have any questions about these comments or require further assistance, please contact William Amy at 512-490-0057, extension 234. Please refer to the Service Consultation number listed above in any future correspondence regarding this project.

Sincerely,

Robert T. Pine
Supervisor

Enclosure

Federally Listed as Threatened and Endangered Species of Brewster County, Texas

DISCLAIMER

This list is based on information available as of on December 12, 2005. This list is subject to change as new biological information is gathered and should not be used as the sole source for identifying species that may be impacted by a project. A list of federally listed or proposed species by county of occurrence in Texas can be found at http://www.fws.gov/ifw2es/EndangeredSpecies/lists/.

Migratory Species Common to many or all Counties: Species listed specifically in a county have confirmed sightings. If a species is not listed they may occur as migrants in those counties.

Black-capped vireo	(E)	*Vireo atricapilla*
Northern aplomado falcon	(E)	*Falco femoralis septentrionalis*
Southwestern willow flycatcher	(E‡)	*Empidonax traillii extimus*
Whooping crane	(E w/CH)	*Grus americana*
Mexican long-nosed bat	(E)	*Leptonycteris nivalis*
Big Bend gambusia	(E)	*Gambusia gaigei*
Davis' green pitaya	(E)	*Echinocereus viridiflorus* var. *davisii (=E. davisii)*
Nellie cory cactus	(E)	*Coryphantha (=Escobaria =Mammillaria) minima*
Terlingua Creek cats-eye	(E)	*Cryptantha crassipes*
Bunched cory cactus	(T)	*Coryphantha ramillosa*
Chisos Mountain hedgehog cactus	(T)	*Echinocereus chisoensis* (=*reichenbachii*) var. *chisoensis*
Hinckley oak	(T)	*Quercus hinckleyi*
Lloyd's Mariposa cactus	(T)	*Sclerocactus (=Echinomastus=Echinocactus) mariposensis*
Texas hornshell (clam)	(C)	*Popenaias popei*
Guadalupe fescue	(C)	*Festuca ligulata*
Yellow-billed cuckoo	(C)	*Coccyzus americanus*

INDEX

E	=	Species in danger of extinction throughout all or a significant portion of its range.
T	=	Species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
C	=	Species for which the Service has on file enough substantial information to warrant listing as threatened or endangered. These species currently have no legal protection. However, addressing these species at this stage could better provide for overall ecosystem health in the local area and may avert potential future listing.
CH	=	Critical Habitat (in Texas unless annotated ‡)
P/	=	Proposed ...
P/E	=	Species proposed to be listed as endangered.
P/T	=	Species proposed to be listed as threatened.
TSA	=	Threatened due to similarity of appearance. Protections of the Act, such as consultation requirements for Federal agencies under section 7, and recovery planning provisions under section 4(f), do not apply to species listed under similarity of appearance provisions.
□	=	with special rule
‡	=	CH designated (or proposed) outside Texas
~	=	protection restricted to populations found in the "interior" of the United States. In Texas, the least tern receives full protection, except within 50 miles (80 km) of the Gulf Coast.

US Fish and Wildlife Service Response Number 2

United States Department of the Interior

NATIONAL PARK SERVICE
Big Bend National Park
Rio Grande Wild and Scenic River
P.O. Box 129
Big Bend National Park, Texas 79834-0129

NATL PARK SERVICE
BIG BEND NP TX
2006 DEC 22 PM 2 49

IN REPLY REFER TO:

N30 (7137)

December 13, 2006

Robert T. Pine
Supervisor
U.S. Fish and Wildlife Service
10711 Burnet Road, Suite 200
Austin, Texas 78758

Consultation Number 21450-2006-TA-0226

Dear Mr. Pine:

Park staff members have been in contact with your office following your August 31, 2006 letter on the proposed Emory Peak trail realignment during the scoping letter period.

Our park botanist with the help of three other Biological Science Technician with considerable experience in plant identification conducted a botanical resource survey in the area of the proposed trail route in the Chisos Mountains area of the park during the week of September 19-20, 2006.

As stated in the attached report, none of the plants located are federally listed as Threatened, Endangered, or Candidates for listing (Table 1). The National Park Service recommends a finding of no effect on Threatened, Endangered or Candidates.

Vidal Davila, our Chief of Science and Resource Management had spoken to William Amy of your office and Mr. Amy was awaiting a copy of the report in order to complete the informal consultation process for this project.

Please let us know if there is anything else we need to do for this project. If you have any question, please contact Vidal Davila at 432-477-1143.

Sincerely,

William E. Wellman
Superintendent

Attachment

NO ACTION
Date: 12/15/06
Consultation #: 21450-2006-TA-0226
Approved by
Robert T. Pine, Field Supervisor
U.S. FISH & WILDLIFE SERVICE, AUSTIN, TEXAS

Texas State Historic Preservation Officer Response

12/13/2006 17:07 919563831677 PAGE 09/10

United States Department of the Interior
NATIONAL PARK SERVICE
BIG BEND NATIONAL PARK
RIO GRANDE WILD AND SCENIC RIVER
P.O. Box 129
Big Bend National Park, Texas 79834-0129

L7619 (7137)

August 17, 2006

RECEIVED
AUG 2 1 2006
Texas Historical Commission

Dear Interested Party:

The National Park Service at Big Bend National Park is proposing a major trail realignment of the existing Emory Peak trail in the high Chisos Mountains. This project proposal will encompass a 1.21 mile realignment taking off from the Pinnacles Pass area (approx. 3 miles from the Chisos Basin).

The new alignment is curvilinear in design, following terrain contours, greatly reducing maintenance, protecting the natural and cultural resources and providing a safer and improved visitor experience. The alignment greatly reduces grade as per the attached map and will utilize material removed from the new trail to fill in severely eroded sections of the existing trail. All unused sections of existing trail will be fully rehabilitated with erosion checks, re-contouring to natural slope and re-vegetated to natural specifications.

There will be some rock structures installed (retaining walls, checks, waterbars) when necessary to gain elevation. All work will be done with hand tools in the Wilderness spirit with project trail crews and volunteer group efforts. This realignment will provide a steady, moderate walking grade and allow for much needed, improved drainage of the trail system thus reducing impact on resources and enhancing visitor health and safety.

The National Park Service is preparing an Environmental Assessment to look at the possible environmental impacts and is soliciting comments on the concerns and issues dealing with this project from the public.

Please submit your written comments online at the NPS Planning, Environmental, and Public Comment website: http://parkplanning.nps.gov/. The 30 day comment period starts on August 17 and ends on September 17, 2006. Our practice is to make comments, including names, home addresses, home phone numbers, and email addresses of respondents, available for public review. Individual respondents may request that we withhold their names and/or home addresses, etc., but if you wish us to consider withholding this information you must state this prominently at the beginning of your comments. In addition, you must present a rationale for withholding this information. This rationale must demonstrate that disclosure would constitute a clearly unwarranted invasion of privacy. Unsupported assertions will not meet this burden. In the absence of exceptional, documentable circumstances, this information will be released. We will always make submissions from organizations or businesses, and from individuals identifying themselves as representatives of or officials of organizations or businesses, available for public inspection in their entirety. All comments become part of the Administrative Record. Written comments can be submitted to:

Superintendent
Big Bend National Park
P.O. Box 129
Big Bend National Park, TX 79834

Sincerely,

Vidal Davila

Vidal Davila
Acting Superintendent

Attachment

NO HISTORIC PROPERTIES AFFECTED
PROJECT MAY PROCEED
By _____
for F. Lawerence Oaks
State Historic Preservation Officer
Date 9-4-06
Track# 200613247

Internal Scoping

Internal scoping was conducted with an interdisciplinary team of environmental professionals from Big Bend National Park. Project information needed to begin internal scoping was entered into the NPS "Planning, Environment and Public Scoping" (PEPC) online system in February 2006. Interdisciplinary team members were provided details of the Proposed Action in several informal meetings, site visits with the Trails Maintenance Supervisor, and through the completion of an "Environmental Screening Form," recorded in PEPC in May 2006. Additionally, interdisciplinary team members met on January 9, 2007 to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and to develop mitigation measures. Prior to the January 2007 interdisciplinary team meeting, data needed to identify potential impacts to resources had been obtained during site visits to the proposed project area by interdisciplinary team members and other technical experts.

Environmental Assessment Review Period

The EA will be released for public review in March 2007. To inform the public of the availability of the EA, the NPS will publish and distribute a letter or press release to various agencies, tribes, and members of the public on the Park's mailing list, as well as place an ad in the local newspaper. Copies of the Environmental Assessment will be provided to interested individuals, upon request. Copies of the document will also be available for review at the Park's visitor center and on the internet at http://www.nps.gov/bibe/parkmgmt/planning.htm and at http://parkplanning.nps.gov/.

The EA is subject to a 30-day public comment period ending April 11, 2007. During this time, the public is encouraged to submit their written comments to the NPS address provided at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the EA, as needed.

List of Preparers

Preparers (developed EA content):

- Deirdre Morgan, NEPA/Cultural Resources Specialist, Morgan Environmental, Castroville, Texas
- Darlene Dyer, Biologist/NEPA Specialist, Morgan Environmental, Castroville, Texas
- Amanda Johnson, Visitor Use and Cultural Resources Specialist, Morgan Environmental, Castroville, Texas

Contributors (provided information and guidance):

NPS, Big Bend National Park, Texas

- Don Sharlow, Trails Supervisor
- Vidal Davila, Chief of Science and Resource Management Division
- Raymond Skiles, Wildlife Biologist and Wilderness Coordinator
- Don Corrick, Geologist
- Thomas Alex, Archeologist
- Betty Alex, GIS Specialist
- Jeff Bennett, Hydrologist and Physical Science Specialist
- Joe Sirotnak, Botanist

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